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ATTENTION

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THE
UNITED STATES AIR FORCE
AIR UNIVERSITY QUARTERLY REVIEW

VOLUME VII

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General Thomas D. White
Vice Chief of Staff, USAF



For the last few years shifting sands of world politics and kaleidoscopic developments in new weapons have sometimes suggested that rapid change is the only constant. Recently questions have arisen as to what effect this pyramid of change has had on the role, the mission, and the doctrine of the U.S. Air Force. At the request of the Editors of the *Air University Quarterly Review*, General White has forthrightly assessed the central position of the Air Force under the current concept of American military strength.

The Current Concept of American Military Strength

Its Meaning and Challenge to the U.S. Air Force

GENERAL THOMAS D. WHITE

SIR Winston Churchill in 1949 seized the minds of thinking peoples on both sides of the Iron Curtain with a public statement unique for political frankness and for unsurpassed realism. Sir Winston said "I must not conceal the truth from you as I see it. It is certain that Europe would have been communized and London under bombardment some time ago but for the deterrent of the atomic bomb in the hands of the United States."

The United States now has adopted for national security a concept which, for realism, matches Sir Winston's statement. We have recognized that our atomic weapon developments form the only effective counter to the overwhelming mobilized manpower of the Soviet. Our Air Force with its ability to deliver nuclear weapons has been recognized as an instrument of national policy. The basic theme of this policy is described by Secretary of State Dulles "to depend primarily upon a great capacity to retaliate instantly, by means and at places of our choosing."

Represented in this theme is an awareness of the simple but subtle fact that modern air forces can be a controlling influence in the world power situation. Although our diplomatic representatives historically have negotiated on the basis of logic and reason, they have generally been supported by elements of military strength. At the international conference tables of the past century naval forces have been the unseen but ever-present influence. Today, the unseen but ever-present influence is the specter of military air forces. A nation's influence in international negotiations is strengthened or weakened by the state of its air forces. The capabilities of this powerful force for achieving decision in major war are thus translated into a capacity for maintenance of world peace.

Such a realistic national policy will cause no drastic changes for the United States Air Force. Air Force ability to support

national policy rests in the inherent capabilities which it has possessed for years.

The philosophy behind the current concept of our military force structure is about as new as the old Keystone bomber. For years, farsighted men have been maintaining these truths—men like Douhet, Mitchell, Arnold, Lindbergh, Slessor, Seversky, and O. A. Anderson.

What is new and encouraging is that today's concept signals general recognition of these relatively old truths. The recent acceptance of these truths has been the result of startling advances in the power of modern weapons. Nevertheless these weapons only accentuate old truths; they do not create new ones.

As a result of new weapons, the nation with a policy of instant retaliation now possesses persuasive power not formerly available. That power stems not only from the increased capabilities of military air forces but also from the increased variety of air capabilities. Thus there is a wide political range of choice available to apply pressure to various forms of enemy conduct.

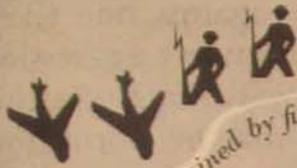
For an aggressor the certainty of punishment for aggressive conduct is greatly increased. For the United States the initiative backed by air power and the willingness to use it can pay real dividends. That initiative is now employed in the attainment of our permanent national objective of maintaining peace. Thus the fundamental aim of our air forces is to deter major war.

To evaluate the feasibility of this proposition, we must examine the character of the deterrent available to the United States. We add the capability of air forces and the use of nuclear weapons to enemy awareness of an intent to use them under certain condi-

The current concept of national defense includes the employment of total air forces to forestall or to halt aggression. Since 1947, aggression by Soviet forces has been checked by the retaliatory threat of U.S. long-range air forces. Because the "firepower curtain" of these forces was employed as a sole instrument of persuasion and because these forces are by their very nature more profitably used in total war, the Communists could by-pass the threat of retaliation by employing satellite troops in limited aggressions. In Korea, theater air forces were brought into action after aggression had begun. Under a policy of employing total air forces, theater air forces could be used in a positive role similar to that of long-range air forces. With the same firm statement of intent to use them against the source of any aggression that has lent reality to the long-range retaliatory threat, properly deployed theater air forces could erect a series of secondary "firepower curtains" along the borders of all free nations. This should make it clear to Communist satellites, before rather than after a new war, that limited aggression would cost more than it was worth.

Role of Total Air Forces under a Policy of Initiative

U. S. S. R.



Major aggression restrained by firepower potential of

USAF long-range air forces

Satellite



Minor aggression checked by USAF firepower potential

Free Nation

deployed theater air forces



tions. The sum is the deterrent. Basically we deter through a real ability to carry the war to the enemy on a massive scale at a moment's notice and the enemy's knowledge that we have such an ability. Yet we must be prepared to respond in many ways. Our force must be capable of application not just against one fixed land area but globally against a sliding scale of enemy aggression ranging from a small show of force to major war. Each possible response must cause an aggressor to recognize that he would lose more than he gains from the aggressive act.

We must make it clear that if our persuasive measures fail and continued aggression forces war upon us, we have the will and determination to use the tremendous power which lies in our air forces and our atomic weapons. If war is forced upon us, we must have clearly stated our terms to the hostile nation. We will use our force as a last resort. This is the ultimate means of military pressure. Even then, of course, we use our air forces not necessarily to totally destroy our enemy but to persuade him to recognize the futility of aggression and to accord his behavior with that of the Free World.

For example, in 1948 the Berlin airlift was a means of using air forces in support of national policy short of the ultimate. But it took more than men and transports to make the Berlin airlift possible. The element which permitted the airlift to continue unmolested by nearby enemy air forces was the specter of our long-range air forces which could act if our transports were attacked. Soviet planners apparently were convinced that the risk of air retaliation outweighed the possible gain from their original objective, total blockade of Berlin.

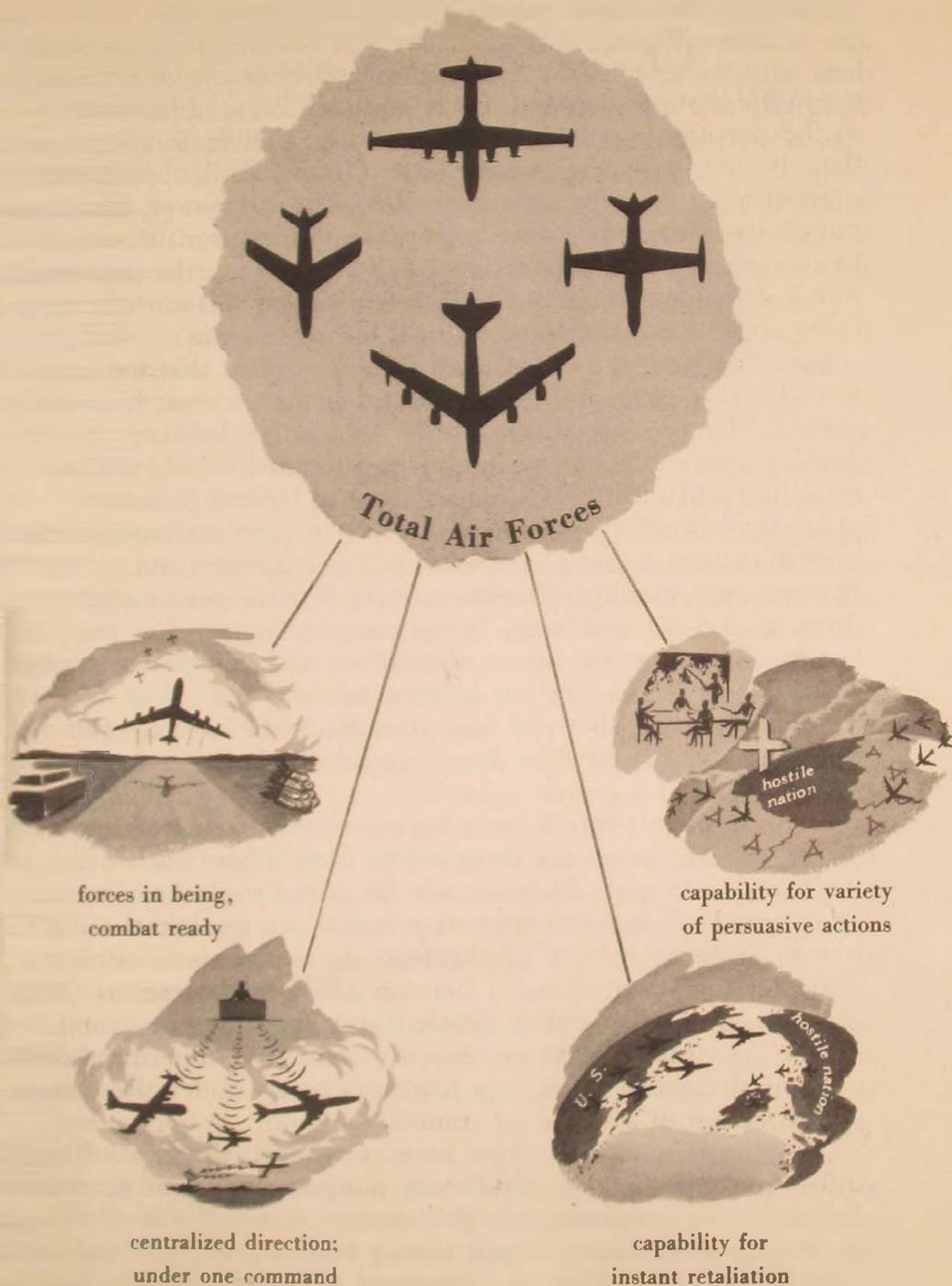
In Korea the Communists massed an imposing jet air force behind the Yalu. However they never made a serious attempt to move that air force as far south as our battleline. Why? It was because we had indicated that our response to such an action would be to implement a planned air campaign against Manchuria.

In Europe 175 Soviet divisions face the free world. What holds them in check? From the beginning they have been checked primarily by the persuasive force of U.S. long-range air forces.

These and other persuasive actions have been executed during a period when we gathered our strength and built our new air forces. How much more can we accomplish in the cause of peace if we are prepared to employ our new air forces under a policy of initiative? It can be no less than clear to a would-be aggressor that he will certainly lose more than he gains.

Now let us turn to the air forces which bear such a heavy

Characteristics of Total Air Forces under a Policy of Initiative



responsibility in implementing our national policy. What will be required of these air forces?

ONE basic assumption underlies any discussion of the individual requirements for modern air forces. I have referred to the persuasive potential of air forces. The basic assumption then is that, properly meshed with our political objective and supported by the other instruments of national power, air forces can achieve lasting peace without resort to total war. But it must be recognized that the effectiveness of air forces in the persuasion role is dependent upon our known willingness and our capability to fight and win a major war, if it is forced upon us.

Now what are the characteristics of air forces that are geared to fulfill this assumption? First, these air forces must be combat ready. The coming of age of the long-range bomber and the development of nuclear weapons have shredded the old timetables of military planning. No longer can the United States sit complacently behind its oceans and leisurely plan on having years or even months to complete traditional mobilization and build-up. If atomic war should strike this country, it will come immediately, through the air and with devastating effect. If our total air forces—long-range air forces, theater air forces, and short-range defensive air forces—are not in existence and trained to top performance on that first day, our country could be destroyed and the war lost before new forces could be built and whipped into shape.

Second, our air forces must have the advantage of centralized direction. Air forces are designed to complement each other in their various roles. They cannot be effective if they are compartmented. Compartmentation prevents full exploitation of air forces. It promotes use of the force in a piecemeal fashion so characteristic of unsuccessful German Air Force operations. Even the best air force, if it is divided and employed in "compartments," is vulnerable to piecemeal destruction. The most effective aerial fighting force is a force operating under the control and direction of a single air commander.

Third, our air forces must have, above all, the capability to inflict instant, effective, retaliatory punishment on an aggressor. From this ability stems the effectiveness of its other actions and its persuasive influence upon hostile nations. Let me add that this ability is shared by the long-range air forces and the theater air forces. One type of jet fighter-bomber can now carry a nuclear

weapon to a target 700 miles away. With refueling, its range can be increased profitably.

Fourth, the ability of air forces to impose a wide variety of effective and persuasive actions must not be compromised. They must be able to respond to hostile actions instantly and with the appropriate degree of force. This will require both mental and physical versatility. It will call for comprehensive planning which exploits with imagination and vigor all the potentialities of the air weapon. It will also require physical mobility provided by a global base structure and supported by a global airlift. With such a system air forces can fulfill the critical requirement to operate anywhere in the world on short notice and for sustained periods.

Air forces then must be instantly available to meet air action with air action. This can only be achieved by centralized direction. Air forces designed to resist aggression must possess an effective retaliatory capacity. They must possess global mobility. They must be capable of exerting appropriate degrees of control in response to various enemy actions.

Having considered the characteristics which total air forces must have, let us now examine the three broad categories of air forces and their missions. Here the controlling assumption is that hostile air forces are the greatest single threat to us, just as the American air forces are the greatest threat to the aggressor. These hostile air forces must always be the primary concern and a priority target of our total air forces.

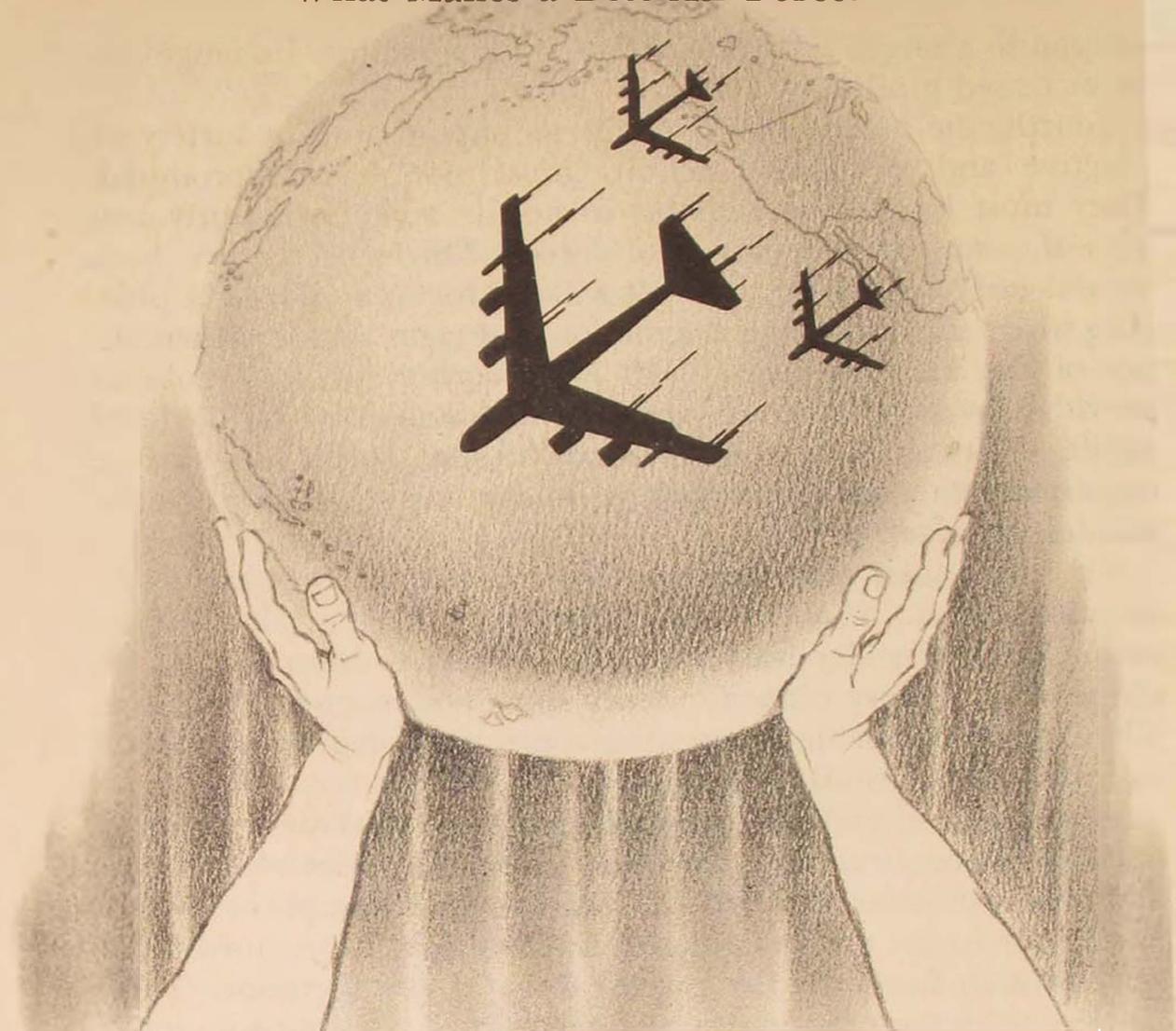
The enemy has air forces similar in capability to our persuasive force. They have a destructive force whose initial assault will demand formidable defenses to blunt.

Long-range air forces, short-range defensive air forces, and theater air forces share in the responsibility for maintaining the retaliatory capacity on which our national security policy is based. If the Soviets miscalculate our strength and strike, the entire air force is immediately involved.

Short-range defensive air forces blunt the initial enemy attack and protect our air capability to retaliate. They also protect components of the American national structure which an enemy hopes to cripple quickly.

Simultaneously long-range air forces penetrate the enemy homeland to eliminate his capacity for long-range atomic attack on our country. They smash elements of his war economy to the extent necessary to bring an end to the war on terms acceptable to the free world.

What Makes a Best Air Force?



Physical:

Superior Capability

Mental:

Superior Employment



Technical knowledge and experience to employ nuclear weapons



Complete understanding of the nature of air warfare



Ability to carry out every detail of delivery



Knowledge of the military and political context within which the air forces are operating



Capability for global rapid deployment of air forces and supporting logistics



A sound but imaginative selection of targets and weapons to achieve the desired type and weight of pressure on the enemy



Continued modernization of the force



Realistic, incisive staff work as a firm foundation for air action

Theater air forces near the enemy must destroy the adjacent hostile air forces, establish control of the air, and neutralize enemy forces on the ground. Obviously these air force missions merge. Short-range defensive air forces, long-range air forces, and theater air forces are inseparable.

LET us now examine the basic requirements for a superior air force. Again there are two main elements, equal in their importance. One is physical—the development of high-quality crews and equipment. The other is mental—the effective employment of air forces in all the facets of their versatility and strength.

Quality of the force hinges on four continuing requirements:

- (1) Technical knowledge and experience for the employment of nuclear weapons.
- (2) Ability of our aircrews to carry out every detail of the delivery mission.
- (3) Capability for rapid global deployment of air forces plus their logistic support.
- (4) Continuous modernization of the force.

The U.S. Air Force has successfully delivered atomic bombs. It stands ready to deliver any new weapons as they develop. The technical knowledge exists within the Air Force to support a national decision to employ nuclear weapons. This know-how is expanding constantly as training accelerates. Meanwhile the capability to employ conventional ordnance will not be permitted to decline, for this would reduce the effectiveness of the total force by seriously impairing its selectivity of firepower. There must be a choice of weapons from which to draw in selecting various responses to enemy conduct.

Our second requirement, the ability of aircrews to carry out every detail of the delivery mission, is met through realistic practice missions led by combat-proven men. The veteran air crews of the long-range air forces repeatedly fly arduous missions of thousands of miles which closely resemble combat missions. This constant, exacting practice, using the best equipment American technology can provide, has materially improved all operational techniques, including flying proficiency, long-range navigation, target identification, bombing accuracy, and in-flight control of numbers of aircraft.

Short-range defensive air forces are on constant alert. They practice interception of our bombers flying long-range training missions. Theater air forces guard the borders of Soviet-domi-

nated areas, and rigorously perfect their tactics in large-scale air and air-ground maneuvers.

In all this training for perfection in air warfare, only the targets themselves and the absence of battle damage distinguish the missions from combat missions. The training of our air crews must be continuous. If D-Day and A-Day coincide, we will be engaged in a major air war that must be pursued to completion on the strength of the aircrew ability which then exists.

Requirement number three is capacity for rapid global deployment of air forces and supporting logistic mobility. Our long-range air forces—bomber and fighter aircraft—are deployed globally in exercises to develop this capability. Air refueling is now unexciting routine. The key to further exploitation of this rapid deployment potential is in the logistic airlift which must support it. Deployed air forces must retain the capacity both for instant action and for sustained action. Our capacity for sustained action must be expanded by increased air logistical support.

Modernization of the force is the fourth requirement to preserve quality capability. It is a requirement imposed upon air forces by the thoroughly competent technology which backs up the enemy air forces. The Soviet air force is now over fifty per cent jet-equipped and is developing rapidly. Complacency on our part could be fatal. Today combat air forces are nearing the close of the propeller-driven phase of flight. We are in the jet age and are moving swiftly into rocket propulsion. On the scientific horizon is the certainty of atomic propulsion.

The United States Air Force must not slow the search for modernization merely because it now leads. If necessary we must "custom-build" air vehicles which materially contribute to the performance of our force. The rate of development in air technology is such that we cannot long rely on fixed inventories of aircraft. If a certain air vehicle shows special promise or if an item of equipment greatly improves our delivery capability, we must have it.

These are the essential actions to maintain the physical element—a superior delivery capability. The machines must be the best, and the men must know how to use them.

This leads into the other element necessary to a "best" air force—the mental element. In any human undertaking there is a margin for error. This margin of error can be reduced by training air crews and by educating our planners and leaders. All our laboriously and expensively acquired force can be made useless by poor command decisions or by inferior and unimagi-

native staff work. Superior employment of air weapons must be based on complete understanding of the nature of air warfare, the political and military context within which the air forces are operating, and a sound but imaginative understanding of targets and weapons.

In the development of superior air leadership the educative process cannot treat air doctrine as a set of abstract principles to be learned by rote like mathematical formulas and dutifully filed away for future reference. Air doctrine is made up not of abstractions but of dynamic, living truths forged in the heat of combat and tested in the crucible of war.

IF major war is forced upon us, air forces must be initially committed primarily to air warfare. A favorable decision against the enemy's long-range air forces must be attained by air warfare for the survival of our nation. In addition similar decision must be gained in the air war in order to provide security for our surface forces for their commitment to ground and sea campaigns.

The air weapons system has inherent freedom of action, unimpeded by geographical barriers and relatively invulnerable to surface weapons systems. Air forces then are free to attack the gamut of enemy military power and the supporting economic and political structure. Conversely the same spectrum of our national strength has become critically vulnerable to attack by enemy air forces. Thus our air force must have the heaviest punch. For when air forces are joined in unlimited battle, there can be no stalemate. The superior air force emerges to pursue the objective to which it is dedicated.

Such truths make up the dynamic doctrine of the U.S. Air Force. The men who built that doctrine began by fire-testing it in combat. In these men exists the largest combat-proven ready source of experience in the employment of air forces in the world today.

That foundation of U.S. Air Force experience now solidly supports the structure of our nation's defense plans. World War II and Korea produced the lessons of the past. The men who learned those lessons must now examine them searchingly and realistically for their application to the future. They should not be limited by the past. They must pay special attention to the opportunities for new and refined employment of the new air weapon. From this will come vitality in future planning for air

forces and the capacity for effective delivery of their awesome striking power. Because the current concept of American military strength so largely rests on the exploitation of what we in the Air Force have long known to be the vital realities of modern power, the concept to us is not so much new or radical as it is the inevitable recognition of the potentialities of air forces.

This presents a compelling challenge to those who give the Air Force its life and direction. In the proper exploitation of these resources lies our best hope that our nation will never have to commit these forces in total war. The strongest military force ever known demands like strength in its leadership. There must be much of the idealist and much of the realist in those who would shape the air age to produce the essentials for peace. The speed and scope of air development create situations which demand vision and imagination, while the solemn responsibility of the Air Force mission requires hard-headed realism and a profound respect for the power which is ours.

Headquarters, United States Air Force

Sinanju-Yongmidong

Sinanju-Yongmidong was unique. Not because a section of enemy territory was seized, occupied, and controlled in the sense that it was denied to him, or because the enemy was driven out, but because these objectives were accomplished entirely by air forces.

The basic principles of the operation were the same that underlie all military action: concentrated firepower brought to bear on an objective area, followed by seizure, occupation, and control of the area to deny its use to enemy forces. Traditionally such action has been accomplished by surface forces in horizontal flanking envelopment or frontal assault. At Sinanju-Yongmidong it was accomplished by air forces in vertical envelopment through the air spaces—a new

...out of gnarled steel and wrenched earth: A New Concept

The Bridges at Sinanju and Yongmidong

A Quarterly Review Staff Study

IN late 1952 a small group of USAF air commanders designed a plan to "buy" a piece of North Korean real estate and deny the enemy its use for a sustained period of time. The method: occupation and control by air forces.

Planned for seizure was a two-mile-long, four-mile-wide strip of land 100 miles north of the battleline, a piece of ground embracing the vital bridge complexes that straddled the Chongchon and Taeryong Rivers at Sinanju and Yongmidong. This lot of ground was especially vital to the enemy's military position. Through it passed the principal supply lines connecting Manchuria with the front lines. Within and around it the Communists had emplaced their heaviest concentration of air defense weapons in North Korea.

The object of the air commanders' plan was to show the Communists that the U.N. could exert an effective form of air pressure at any time or any place, could capture and air control any desired segment of his territory for as long as the military situation warranted.

The air envelopment and neutralization of this critically sensitive and heavily defended communication corridor across the Chongchon would uniquely demonstrate this potential. At the same time it would spell out a sharp warning of the character of the air action to come, should events compel the lifting of the operational restrictions on U.N. air forces.

In early January 1953 the Sinanju-Yongmidong rectangle was enveloped

dimension which the advent of combat air forces has added to modern war.

Had a contingent of ground troops been dropped at Sinanju-Yongmidong, had it captured, occupied, and controlled it for eleven days, demolishing all bridges and enemy installations in the area, had it then withdrawn with only *one* casualty, the spectacular operation would have highlighted the entire Korean War. Though the same results were accomplished by air forces, the concept of occupation and control of enemy territory by air forces was so new, so revolutionary, and so "heretical" that the substance and meaning of the action passed by completely unnoticed.

Sinanju-Yongmidong points to offensive employments of theater air forces, with the atomic capability of the fighter-bomber promising limitless potentialities.

To provide dimension and perspective to the remarkable air action at Sinanju-Yongmidong, to point up its implications for the role of air interdiction as decisive air pressure, the Editors of the *Quarterly Review* examine the target area, its relation to the enemy's logistic network, the previous interdiction attacks upon it, and the meaning and significance of air envelopment.

in a massive 5-day, round-the-clock air assault. Coordinated attacks spread paralysis along the transport arteries above and below the main target. To this gigantic operation FEAF committed 2292 combat sorties.

For five days a devastating force walked the earth over a 2-by-4 mile target area. For six days following the final day of mass attack nothing moved through the sealed-off zone. Day and night, follow-up strikes teamed with armed reconnaissance to exercise air control. Air forces bought a piece of real estate 100 miles behind enemy lines and ruled it for 11 days.

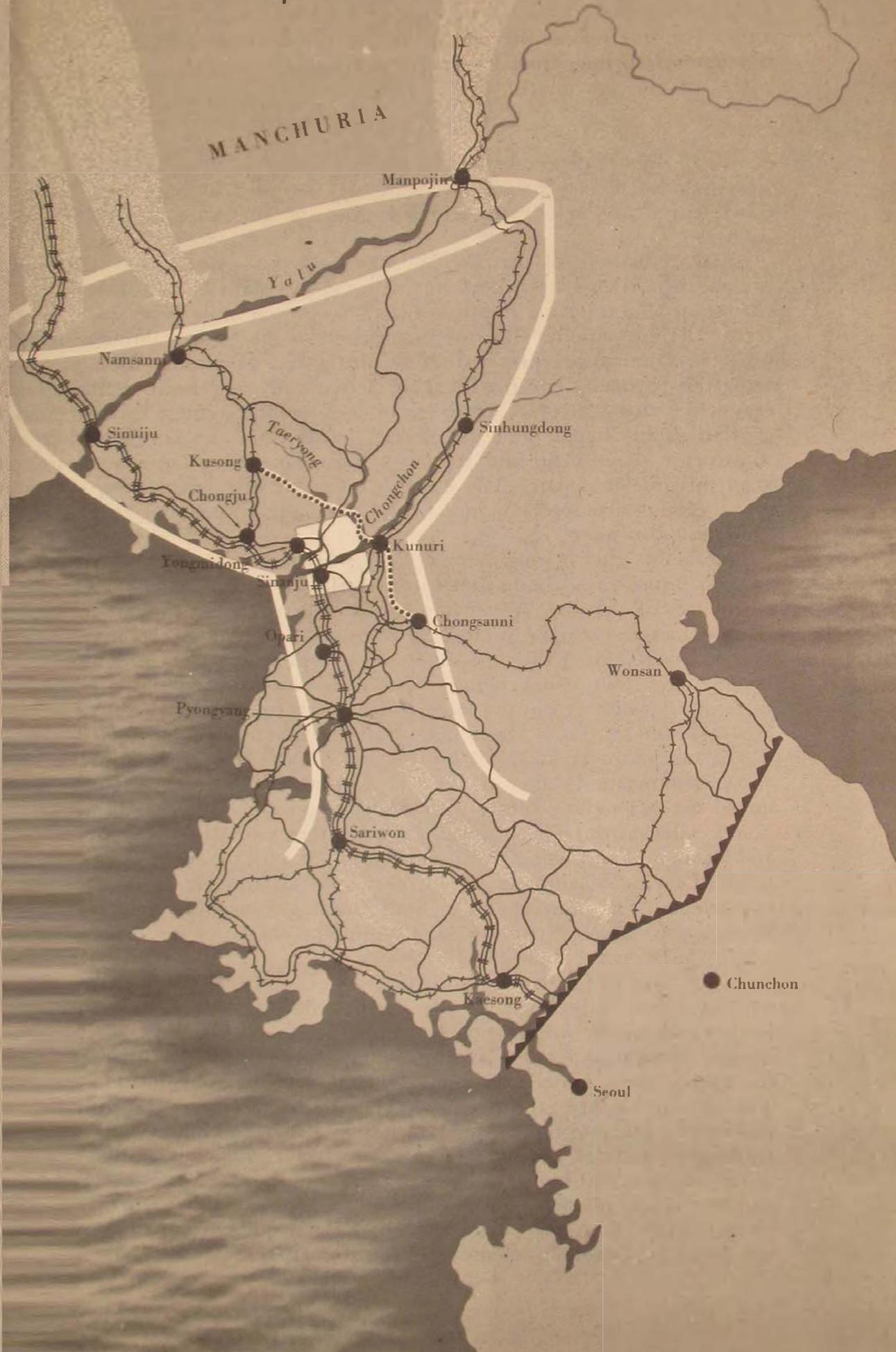
The story of this air operation displays another step in the evolution of a concept for the employment of air forces as the sole extended, effective military pressure in war. Of major importance for doctrine and planning, it exhibited the capability of modern air forces to seize, occupy, and control a ground area as surely as these objectives had been traditionally accomplished by ground forces.

The Chokepoint

THE bulk of logistical support for the Communist military forces was rail-roaded across the Yalu at Sinanju, Namsan-ni, and Manpojin. Destruction of the Yalu River bridges would have cut the flow into North Korea, but these fat targets were ruled out by directive in April 1951, to avoid expanding the war. Supplies had to be destroyed after they entered the North Korean transportation system. Extending southward from the Yalu points of entry, the main rail and road arteries converged like a giant funnel to cross the Taeryong and Chongchon Rivers near the towns of Sinanju and Kunuri. These rivers laterally bisected the west coast transportation network. The mountainous backbone of central North Korea largely constricted supply routes into the funnel neck shown by the illustration. Once across the Taeryong and Chongchon, the main arteries fanned out into numerous primary and secondary roads that spider-webbed down the funnel neck to the rear areas of the battle line.

Vital elements of the whole system were the Chongchon-Taeryong River bridges. At Sinanju and Yongmidong (white block on illustration) two big bridge complexes spanned the river channels to connect the northern and southern halves of the road and rail network. North of this chokepoint the rail system constituted the backbone of the network, while south of the river the rail system was supplemented by interlacing highways, roads, and trails. Most of the enemy supplies were dispatched from Manchuria by rail across the Yalu and down to Sinanju, where the greater part of it was off-loaded to trucks, ox-carts, pack animals, and human pack trains carrying "A" frames to shuttle southward over the interminable network of primary and secondary roads and trails. Once supplies had entered the southern half of the system, they became increasingly difficult to interdict. A jury-rigged variety of transport filtered supplies southward in unscheduled and unpredictable delivery over devious routes from hidden storage dump to hidden storage dump. Within 50 miles of the front lines logistic support was forced to rely mainly upon pack animals and human pack trains. These were independent of roads, bridges, or other modern transportation facilities. The most effective attacks upon the logistical flow could be made north of Pyong-

Transportation Funnel



yang and especially from the Chongchon River chokepoint northward to the Yalu. For this reason the enemy located the heaviest defense of his key communication lines from Pyongyang northward.

The Target Area

At the beginning of the Korean War the closely paralleling channels of the Taeryong and Chongchon Rivers were each spanned by one massive steel-concrete rail and one road bridge at Sinanju (below) and Yongmidong (above).

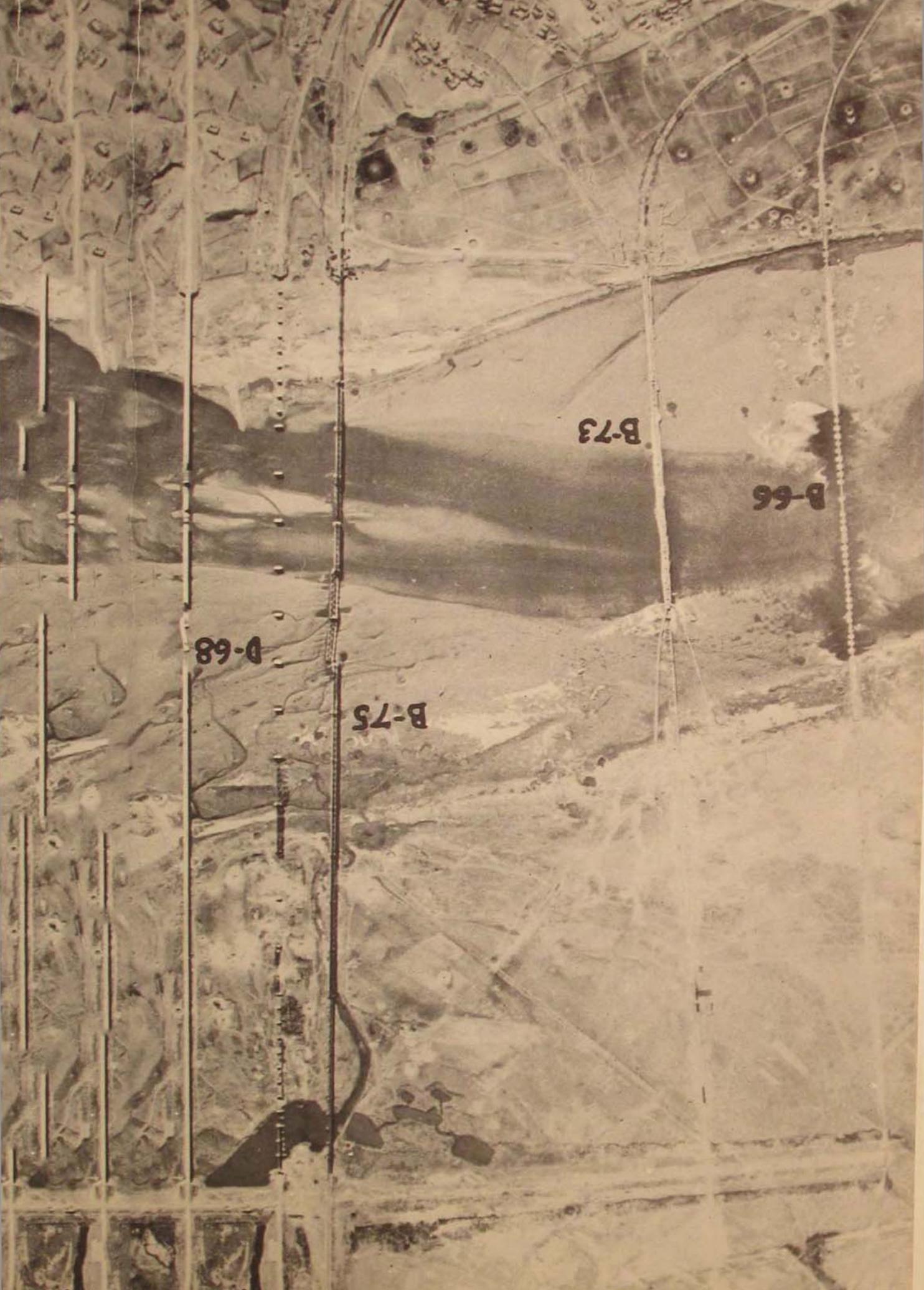
By 1952, because of periodic air attack on this sensitive target, eleven bridges had arisen like malformed fingers of two giant hands. The bulk of enemy supplies traveling down the west coast system rolled over these structures. Despite periodic U.N. air interdiction of the bridges throughout the war, the Communists persisted in repairing and rebuilding them and in using this particular crossing for their many supply movement. Perhaps one reason was that the route over these bridges was the shortest between Manchurian supply depots and the Korean battle lines. Lacking the rails to construct a second main line, the enemy cannibalized less important lines to keep this line in repair. The 3½-mile-wide spit of land between the two rivers gave the complex an indestructable middle anchor and an extended transverse dimension.

The double-track Kyongui trunk line (shown entering from left) was the enemy's primary rail connection with Manchuria. It fed materiel southward out of two of the three Yalu river points of entry—Sinuiju and Namsan-ni. Double-tracked north to Sinuiju, it connected at Chongju (about 25 miles west of Yongmidong) with the single track running north to Namsan-ni. At Yongmidong the rail line fanned south across the Taeryong on five bridges and quickly converged at the large switching center and marshalling yard of Maengjung-dong. From Maengjung south the line again fanned out to cross the Chongchon over huge rail bridges and connected with the main supply and communication center at Sinanju. A spur rail line (entering from top) linked the Maengjung center with the Pakchon-Namho-dong highway junction 4 miles north. The highway entering from top left led out of Sinuiju and Namsan-ni and, across the Taeryong, joined with the highway from Manpojin. Leaving Maengjung the highway split to cross the Chongchon over two bridges. The railroad and highway entering from lower right connected Sinanju with Kaechon, Kunu-ri, and Manpojin—the latter the third point of supply entry on the Yalu.

Several ridges of hills run down the spit of land between the two rivers, lending terrain advantages to the enemy's defense and to transportation deployment in the area. Outside approaches to each bridge complex are flanked by hills and ridges angling to the river's edge. Air approaches to the target were limited, since all bridges lay along one horizontal axis. Throughout the area the enemy emplaced scores of antiaircraft weapons, making the bridge complex the most heavily defended area in North Korea. Intelligence counted at least 90 heavy guns and 45 automatic weapons prior to the attacks on 10 January. Under direction of Chinese and Russian officers and engineers, hundreds of North Korean civilians and soldiers in regimented labor and combat battalions stood by for quick repair to bomb damage or for local ground defense against air or ground attack.

Target: the Bottleneck





B-73

B-66

D-68

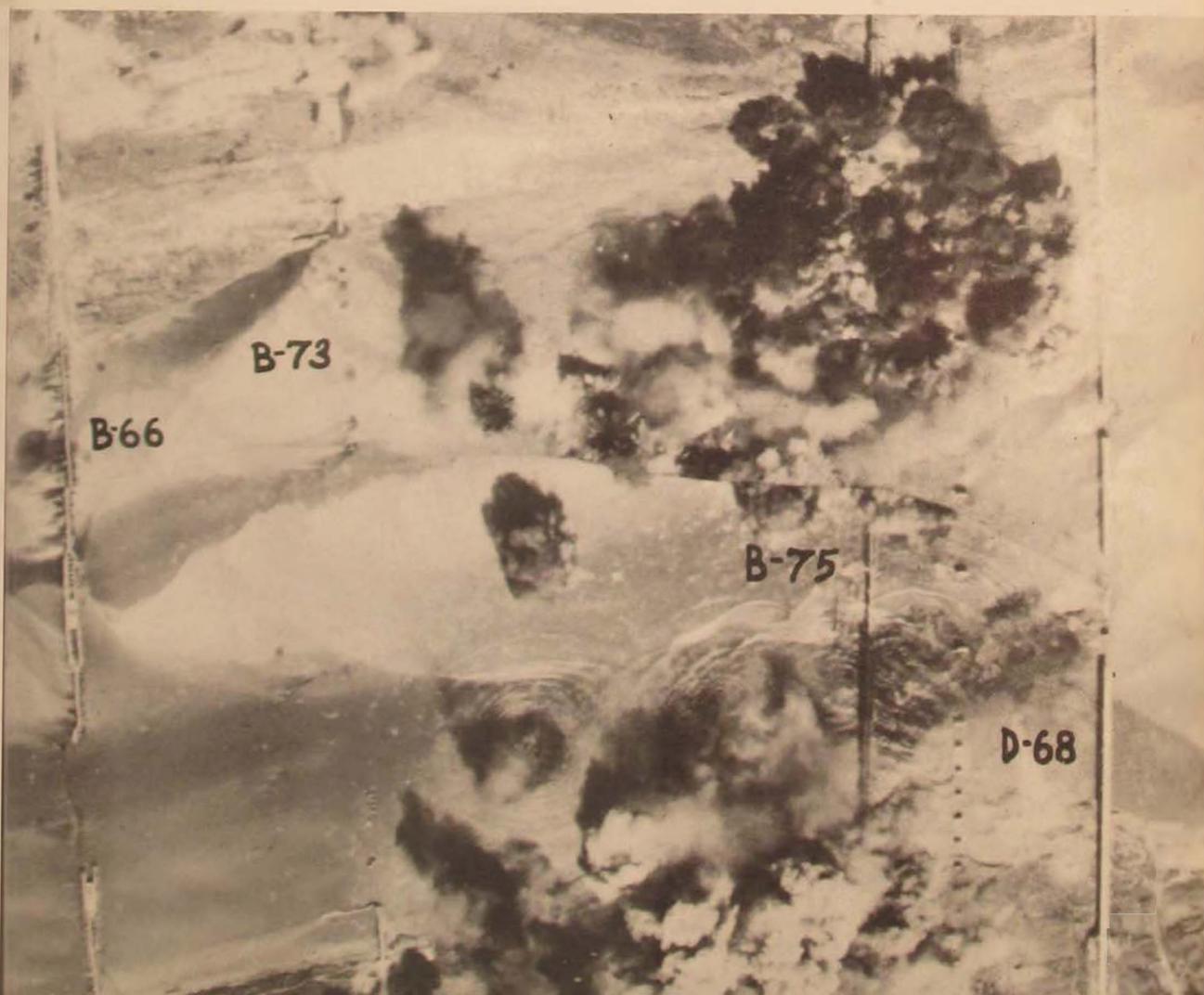
B-75

Previous Strikes

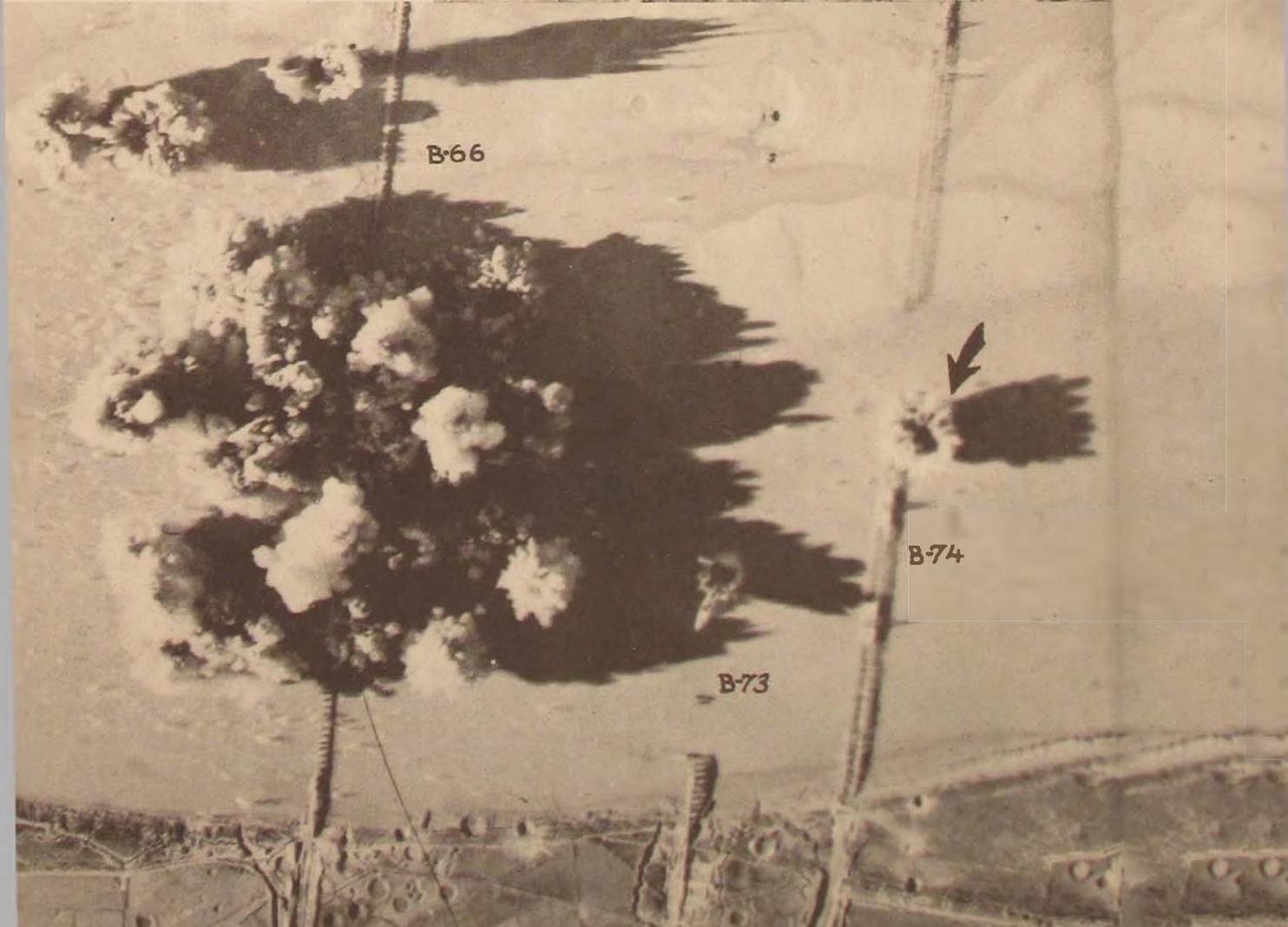
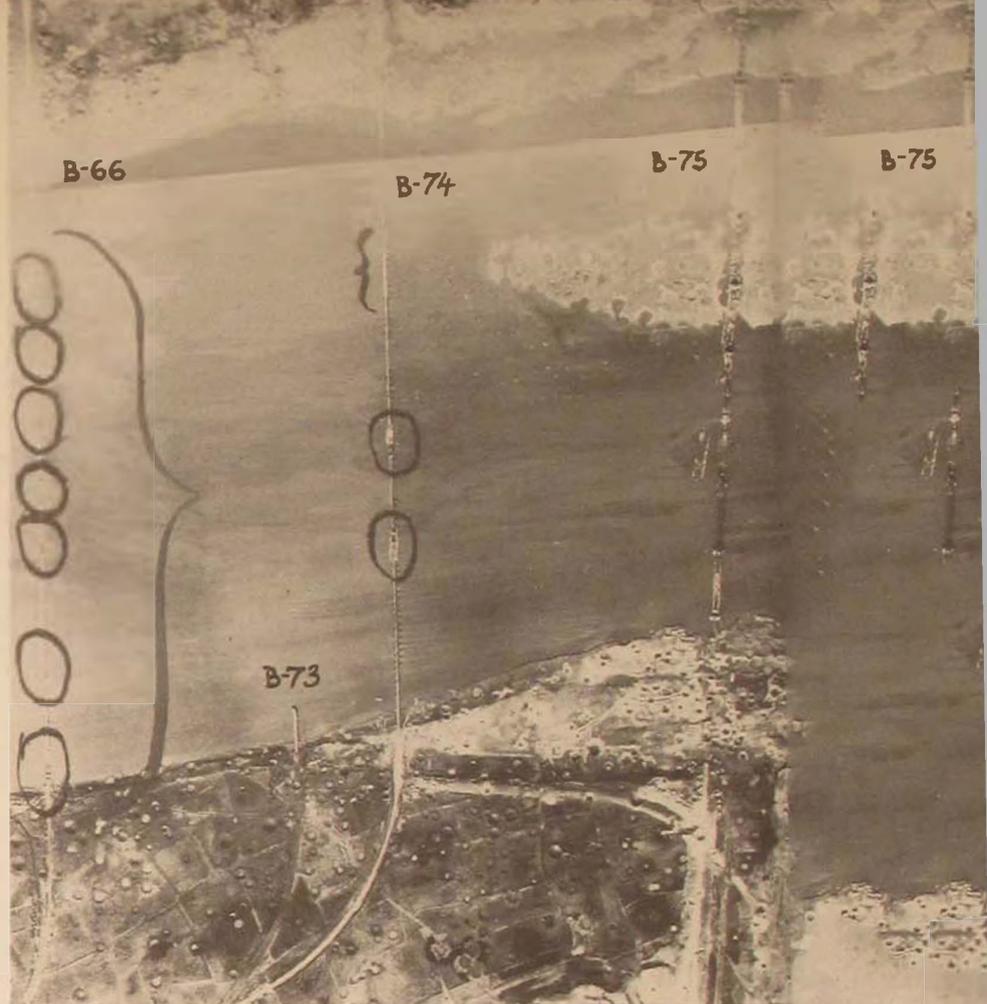
Throughout the war the Sinanju-Yongmidong bridges were periodically interdicted by U.N. air forces. Helpless to prevent the attacks, the enemy resorted to the only countermeasures available to him. He set about to build size and flexibility into the target, so that it could absorb air attacks and still remain serviceable. He soon multiplied the original rail and highway bridge over each river to eleven in the hope that one through line would remain open. To make the target less palatable to U.N. air forces, he fortified it with his heaviest concentrations of anti-aircraft artillery.

Few targets in North Korea so vividly demonstrate the repetitive cycle of aerial destruction required if ground forces do not exploit the tactical advantages afforded by air interdiction and if the enemy is permitted leisure to commit large segments of his deployed military effort to recuperation. Stubborn, determined Communist insistence to rebuild the Sinanju-Yongmidong bridges in the face of recurring destruction tipped U.N. air commanders to their military sensitivity, their vital support relation to enemy ground forces. These selected photos of the Sinanju spans typify the oscillating history of the whole complex from September 1951 to October 1952.

In May 1951 the war on the Sinanju bridges was almost a year old. Of four completed bridges (left) only B-66 is serviceable, but it is a pontoon bridge of limited value. By 4 September 1951 (below) B-66 has a large gap in it, B-73 has disappeared, D-68 is broken in three places, and a neat bomb cluster is taking care of B-75.



Cover on 2 April 1952 (right) shows a brand-new bridge, B-74, has appeared since September. It is already under repair in two places. B-66 is broken in seven places, and big B-75 is wavering drunkenly, with one steel span blasted into the water by an attack on 28 March. On 27 July 1952 (below) B-74 has a long gap in it again and B-29's have just scored a bullseye on B-66.





Throughout the summer of 1952 surveillance and strikes on the bridges continued. This 16 October 1952 strike photo shows a medium bomber attack bracketing the bridges B-66 and B-74. Highway bridge D-68 and rail bridge B-75 are unserviceable.

Sinanju-Yongmidong Strikes Lifted

By the fall of 1952 a shift in air interdiction emphasis was imminent as the air campaign entered the final *exploitation phase*. This phase was marked by a withdrawal of the incessant, routine air interdiction from all of North Korea to concentrate air effort more immediately behind the battle-line. Air interdiction strikes were extended to specific target areas farther north when reconnaissance and intelligence reports reported those areas critical and sensitive. Quality air reconnaissance and intelligence afforded an amazingly accurate count of the enemy's military pulse and enabled combat air forces correctly to time and place any extended air strikes along the enemy's lifelines where resurgence of activity was detected.

The Exploitation Phase in Perspective. Wars can be viewed against several useful and equally valid frames of reference. General Weyland recently reviewed the Korean War in terms of objectives, threats, and opportunities.*

*General Otto P. Weyland, "The Air Campaign in Korea," *Air University Quarterly Review*, VI, 3 (Fall, 1953), 3-28.

The tactical execution of the Korean air war can also be considered in the three traditional military phases of war: build-up, decision, and exploitation.

The *build-up* phase of the air war saw the air forces gathering their strength to assist the land forces in furtherance of a moving land campaign against the Communist ground forces. The truce talks that began in July 1951 changed the U.N.'s original political-military objective from capture and control of North Korea to the attainment of an armistice on favorable terms. The new U.N. objective was accompanied by a change in military strategy. Under the new strategy, air forces were assigned the missions of maintaining control of the air, denying the enemy the capacity to maintain and sustain any further major ground offensive, and maintaining maximum pressure through air attack on the enemy to force a favorable armistice. The ground forces were directed to stabilize a strong defense line across the peninsula to protect U.N. air bases from ground attack. Air forces became the offensive component of the combined forces, and air attacks the offensive element of combined strategy. With this change air forces initiated the *decisive phase* of the air war in July 1951.

For over a year this decisive phase continued as the air offensive pounded the enemy from the front lines to the Yalu River. Subjecting every element of the deployed military forces to relentless air attack, air forces drove them almost entirely underground. The incessant 24-hour, round-the-clock air interdiction of supply and communication arteries stopped 90 per cent of enemy supplies from reaching the front. But facing no real ground pressure or threat of U.N. ground offensive, the enemy had no compelling time table to govern operations and consequently no urgency for receipt of supplies. In a ground stalemate Communist over-all requirements for supplies were reduced to around 40 tons per division per day—less than a tenth of the amount required by a U.S. division under the same conditions. The Communists could meet these small requirements through a system of supply by osmosis—relying on the small-scale rail and truck delivery that could get through, supplemented by primitive delivery by pack animals and human bearers.

Daylight traffic on North Korean rails and roads had long ceased. Hiding in tunnels or under camouflaged structures by day, enemy trains and trucks slithered along patched-up rails, roads, and bridges during the hours of darkness. The hasty repair of air strike damage, not up to Western standards, did not permit traffic to move in volume. At most a locomotive with a car or two could snail crawl along at night. Repaired rail lines, highways, and bridges were treacherous; derailments and break-throughs were frequent. But the patching continued as fast as U.N. air forces knocked out the tenuous connections. Shuttling supplies by pack animal, ox-cart, and A-frame greatly assisted in by-passing interdicted lines. Although the enemy paid heavily in manpower and material resources, some supplies continued to get through.

By late fall of 1952 the decisive phase of the air war had been realized. Decision considered in relation to the theater objective (which was armistice on favorable terms), had arrived when the air forces had pounded the enemy until he could no longer sustain offensive land operations.

The relentless air attacks had ranged from the front lines to the Yalu. They had broken the enemy's logistic capability to launch and sustain a major ground offensive. They had kept him under the weight of constant military air pressure. They had preserved the "balance" on the ground

to await an armistice. Continuous air force slashing of communication lines and otherwise isolation of the battlefield had reached the point of diminishing returns. As it was, the enemy was forced to expend herculean efforts to keep his supply lines in shape to move a relative trickle of tonnage.

A more lavish application of air forces to get the last 10 per cent of enemy supplies—the final pay-off—would have required either increased air forces or lifting the restrictions on air operations and types of ordnance. None of these were pending.

Around November 1952 air commanders felt the air reduction of enemy offensive capability had been effectively achieved and that a reduction in the air sortie effort would still maintain sufficient pressure on the enemy's supply lines to keep him relatively impotent in the battleline.

This then marked the beginning of the *exploitation phase* of the air war and initiated a concept of air operations which became known as an *air holding action*. The air holding action consisted primarily of careful selection of targets which were lightly defended and which would pay sufficient dividends to warrant attack; of monitoring the enemy military pulse and applying heavy air pressure wherever resurgence of enemy activity promised a lucrative and sensitive target; of bringing air-ground operations above 3000 feet so as not to expose a \$400,000 aircraft and a highly-trained pilot to machine gun fire for the sake of destroying a few trucks; of placing greater emphasis on combat training, especially the formulation and execution of detailed air plans which exploited the coordinated attack possibilities of medium bombers, light bombers, fighter-bombers, and fighter cover; of conducting such air support for the Eighth Army as would keep the close-support system well oiled and would ease the pressure along the front during enemy limited offensives.

Exploitation Phase Shifts Emphasis. The exploitation phase shifted the bulk of the interdiction effort south of a line running from Pyongyang to Wonsan—except for strikes on exceptionally lucrative targets, such as troop concentrations, marshalling yards, industrial plants, etc., where the employment of air forces was considered worth the benefits derived from the strike.

For the last two months of 1952, Fifth Air Force threw over 30 per cent of the combat effort into a 24-hour-day interdiction to make sure that no road or rail bridge stood, that no rail track or roadway south of the Pyonglang-Wonsan line was usable. Although the enemy lines of communication and supply were less heavily defended in this area, the tasks of interdicting supplies near the immediate battle zone was far more difficult and less economical from the air standpoint than the previous program of hitting the supply arteries farther north. But the results were gratifying. Less experienced crews (the majority of veteran crews by this time had been replaced by youngsters just out of flying school) received excellent training under easier combat conditions than they would have experienced farther north where they would have been subject to air attack. And interdiction in this area put a further drain on the enemy's transport system by causing him to carry his repair materials 50 to 100 miles further south over a system already at the verge of breakdown.

With the shift of interdiction to the southern sector of the network, strikes on the Sinanju-Yongmidong bridges were limited. The last large attack occurred in early October 1952. The enemy immediately detected the switch. Either believing it a change forced upon the U.N. or forgetting earlier les-

sons of air pounding, the enemy began lifting his self-imposed restrictions on logistical movements in the north. Armed air reconnaissance reported rapid rebuilding of all interdicted bridges, including the Sinanju-Yongmidong structures, and the reconditioning of the main rail lines into operational supply arteries. Rail supply movements from Manchuria south across the Sinanju-Yongmidong bridges were greatly increased. Supplies were moved with an openness akin to bravado and military stupidity.

Taking advantage of the let-up in air strikes, the Communists forgot their caution, came out from underground, and began a logistic build-up in the north, either to support a major ground offensive or to stockpile supplies and ammunition for a prolonged stalemate. Whatever the motives for the surge in supply activity, U.N. air commanders decided the enemy needed another lesson. The U.N. forces would spell out the fact that control of the air over North Korea gave the U.N. the power to control the surface below and to regulate or nullify any effort the enemy might undertake on the ground.

Return to Sinanju

Theory Translated into Air Operations

The Plan: Primary objective of the plan to air-envelop Sinanju-Yongmidong was to hit the heavily defended bridge complexes so hard that the area would be completely unusable by the enemy for a sustained period of time. Effective and sustained air envelopment would require paralyzing not only the Sinanju-Yongmidong corridor but also a considerable stretch of the lines of communication leading north and south out of the area. Supporting attacks on secondary objectives therefore would have to include the rail lines, marshalling yards, roads, and bridges for a distance of 75 miles above and below the Chongchon. These paralyzing attacks could continue after the envelopment of the main area.

Completely severing the rail and road lines at the Chongchon River line in a massive demonstration of air power would not only show the enemy the potentialities of the air forces opposing him but would hand him a problem compounded by his immediate and continuing dependence upon the flow of supplies from Manchuria down across the Chongchon and Taeryong bridges.

Aside from the immediate military and psychological effects the envelopment would have on the enemy, the Chongchon rupture would back up railroad rolling stock in marshalling yards and sidings all along the trunk lines, creating lucrative targets for air attack over a prolonged period of time. Greater quantities would have to be trucked out of Manchuria, swelling vehicle movement over the tortuous and vulnerable roads between Manchuria and the Chongchon River. A general increase in highway traffic would be induced all over North Korea, furthering concentration and congestion on primary and secondary roads and exposing valuable targets for U.N. armed air reconnaissance. With the beginning of the seasonal thaws around the middle of March, truck and vehicle traffic would have to follow the main highways, as secondary roads would become impassable. Mud and swollen streams would make by-passing of post-holed stretches of highway and unserviceable bridges next to impossible.

The disruption in the entire logistic system would be enormous. Supplies would have to be painfully and slowly shuttled around interdicted lines of communication or entirely rerouted over the east coast system. This latter was highly unlikely. The east coast system fed out of the U.S.S.R.'s Trans-Siberian railroad. Entering Northeast Korea, it snaked down the long, highly vulnerable Korean east coast to Wonsan. Use of this supply route would place an extra load on the eastern sector of the Trans-Siberian route—presenting a low-priority transportation burden the "Siberian-busy Soviets" would not care to sustain.

In addition, stepped-up attack on the whole west coast system would force the enemy to shift his antiaircraft defenses to his next most sensitive spots. This move would reveal the weakest and most valuable links in his logistic chain. It would also require the commitment of thousands more of his military and civilian personnel to repair work, seriously depleting his front-line combat and military support activities.

The Assault: On the night of 9 January 1953, 18 Okinawa and Japan-based B-29's rode through intense antiaircraft fire to radar-aim 170 tons of bombs on the Sinanju-Yongmidong bridges, flak batteries, and railroad marshalling yards.

Less than 12 hours later over 300 Fifth Air Force fighter-bombers dived 282 tons of high explosives on eight of the key rail and highway bridges and 27 of the antiaircraft gun positions defending the complexes.

These two attacks kicked off the massive 5-day (10-15 January 1953) air assault on the Sinanju-Yongmidong bridge corridor.

For the next four days and nights Far East Air Force bombers, fighter-bombers, and fighters hammered the two-by-four-mile bridge area in relentless, coordinated, round-the-clock attack. Great formations of 200 to 400 fighter-bombers roared down in wave upon wave to keep the area under constant demolition. Eight fighter-bombers per minute went into target, two each 15 seconds—including roll, track, and release. It was a formidable demonstration to the enemy he could not stop determined air attack regardless of concentration of flak.

By night flak-suppressing B-26's joined the fighter-bombers in hammering antiaircraft positions and strewing time-fused and frag-clustered bombs throughout the area to pick off defending personnel.

The daylight assault was taken over at night by the B-26's and B-29's. Large numbers of F-86's, by day, and F-94's, by night, escorted the attacking aircraft, effectively screening the operations against intruding MIGs from the Yalu region. Both day and night, high-and-low-altitude harrassing attacks kept the area under complete air cover, picking off ack-ack positions, searchlights, and anything that moved or that had been left untouched in the mass attacks.

Supporting the main assault on the bridge area, Fifth Air Force fighter-bombers ranged up and down the rail lines north and south of the Chongchon, seeking targets of opportunity, ripping up sections of the rail system, post-holing road beds, and tearing down bridges. Medium- and light-bomber night strikes smashed numerous marshalling yards above and below the Chongchon. Formations of B-29's wrecked the rail and highway center at Namsi, the Sinhungdong Bridge far up the Chongchon, and rail switchyards along the line south of Sinanju. These attacks extended 50 to 75 miles

13 January 1953: One of Five



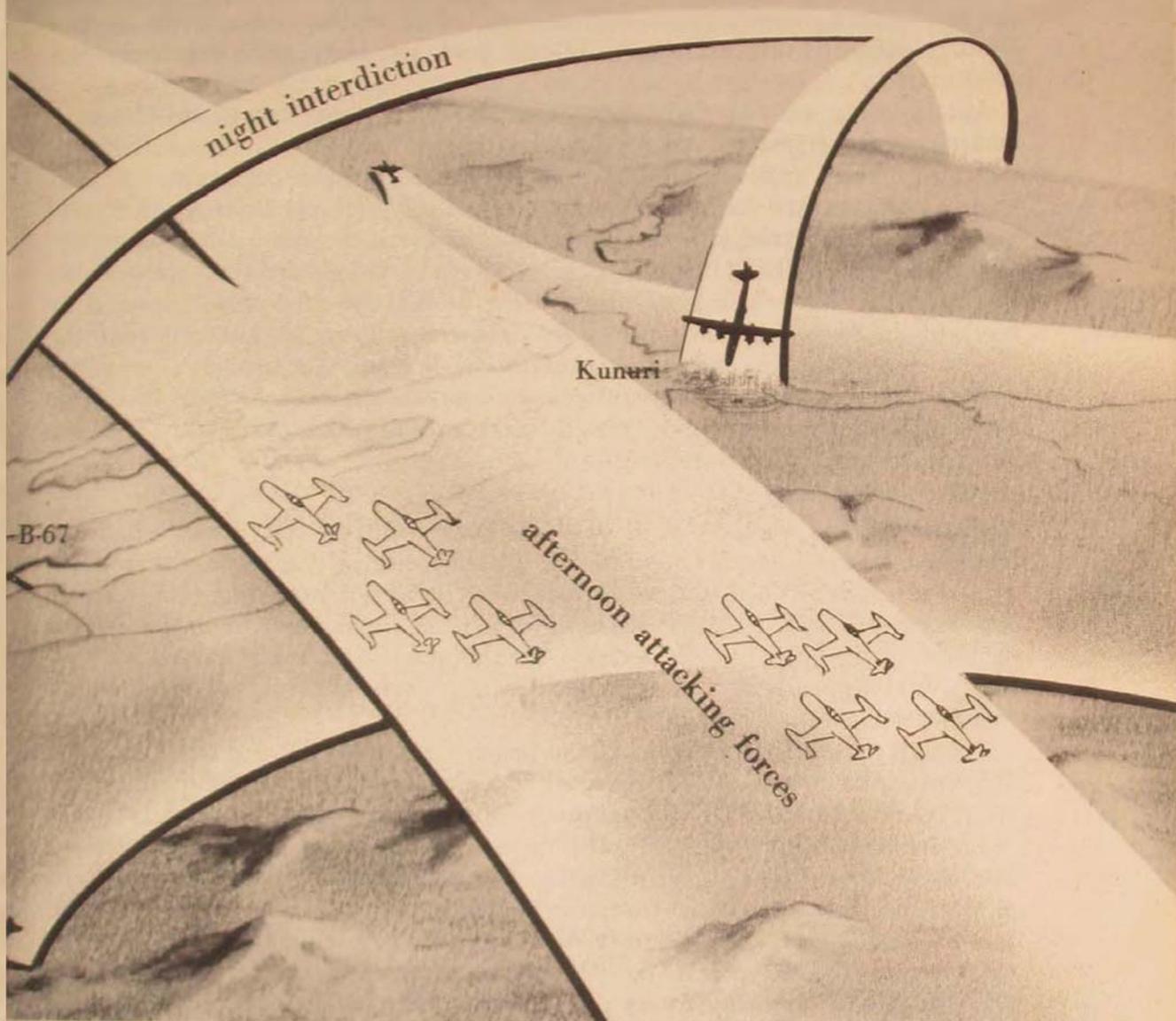
Night 12/13 January

Target	No. a/c	Unit
Harassment	6 B-26's	3 LBW 17 LBW
Kwaksan M/Y	6 B-29's	
Chongju M/Y	6 B-29's	
Searchlight suppression	5 f/b	49 F/B 58 F/B
Total	23 a/c	

Morning 13 January

Target	No. a/c	Unit	Time on Target
Flak suppression	114 f/b	8 F/B 474 F/B 49 F/B 58 F/B MAG 33	0901-0916
B-62	8 f/b	49 F/B	0920
B-63	11 f/b	58 F/B	0925
B-64N	9 f/b	474 F/B	0928
	1 f/b	58 F/B	0920
B-64S	10 f/b	474 F/B	0935
B-66	9 f/b	58 F/B	0919
B-67	12 f/b	8 F/B	0922
Total	197 a/c		
Fighter cover	122 F-86's		

Days of Air Envelopment



Afternoon 13 January

Target	No. a/c	Unit	Time on Target
Flak suppression	103 f/b	8 F/B	1455-1530
		474 F/B	
		49 F/B	
		58 F/B	
		MAF 33	
Harassment	8 B-26's	3 LBW	1951-2232
B-63	7 f/b	58 F/B	1515
B-64N	12 f/b	474 F/B	1526
B-64S	12 f/b	478 F/B	1515
B-71	6 f/b	58 F/B	1500
B-66	6 f/b	49 F/B	1517
B-67	12 f/b	58 F/B	1517
		49 F/B	
		1519	
	3 f/b	49 F/B	1519
	11 f/b	8 F/B	1522

Total 180 a/c
Fighter cover 100 F-86's

Night 13/14 January

Target	No. a/c	Unit
Harassment	8 B-26's	3 LBW
	4 f/b	474 F/B 8 F/B
Sinanju M/Y	6 B-29's	
Kunuri M/Y	6 B-29's	
Total	24 a/c	

Enemy Air Reaction

Morning—none
Afternoon—168 MIGs sighted
24 engaged
2 destroyed
2 damaged

north and south along the transport arteries leading into the Sinanju-Yongmidong rectangle—serving to paralyze the axes leading into the hub and to complete the effectiveness of the air envelopment.

The gigantic five-day operation mounted a total of 2292 combat sorties, excluding reconnaissance sweeps, air rescue, and cargo missions. This was 54 per cent of all FEAF combat effort. Fifth Air Force contributed 1243 combat sorties, of which 1116 were flown by the workhorses of the Korean air war—the fighter-bombers. Total air sortie outlay committed to the assault including air transport, rescue, and reconnaissance ran over the 4000 mark.

At the close of the fifth day, Sinanju-Yongmidong lay smouldering, a reeking mass of gnarled steel, wrenched earth, and jagged chunks of concrete torn away and hurled hundreds of yards over the landscape. Trains, freight cars, and trucks caught between the Taeryong and Chongchon Rivers were wholly or partially buried under tons of earth thrown up by the impact of demolition bombs. Others, within or above or below the area, were sealed in the tunnels in which they were hiding or bottlenecked and destroyed by landslides. Reconnaissance pilots in post-strike interrogation reported the "entire area torn up, the approaches to the bridges, the bridges themselves, and the area between." One pilot commented, "the bridges look like some giant picked them up and twisted them around like pretzels . . . it's a wonder if there is anything left."

A Battle Within a Battle—The War on Flak: One of the lessons which the air commanders intended for Sinanju-Yongmidong to convey was that determined air attack could not be stopped by ground defense. Since the concern for air losses figured in the planning of all air actions in Korea, the density of Communist antiaircraft defenses in the small Sinanju-Yongmidong area made flak suppression a major consideration in translating the air envelopment into operations plans.

Pre-strike intelligence reported the bridges and adjacent are defended with 135 antiaircraft weapons—90 heavy guns and 45 automatic weapons—which the enemy constantly shifted to render any air attack a hazardous venture.

Pre-strike surveillance had pinpointed and targeted occupied positions, but on the first strike, U.N. pilots found many of the targeted flak positions empty and flak appearing from unexpected quarters. The flak-suppressing jets streamed down into the thick of the gunfire to silence the positions. Said one World War II veteran fighter-bomber pilot, "I never saw anything like it. They were shooting at us point blank with heavies. I could even see the muzzle blasts. Flak was like a confetti barrage on Broadway."

The bridge strikes required the most intense all-out war on ground defense conducted during the Korean campaign. B-26's teamed with B-29's to go after ack-ack and searchlight positions during the hours of darkness. Of the six principal daylight fighter-bomber strikes, 713 of the 1166 sorties were flak suppression sorties, while 453 were flown against the bridges.

That the tactics paid off handsomely is reflected in U.N. air losses. Out of the thousands of aircraft sorties over the target area, only seven fighter-bombers were lost with six of the seven pilots rescued by amphibians or helicopters hovering nearby off the mouth of the Chongchon; twelve fighter-bombers received major damage and 19 sustained minor damage.

Results

A Slight Delay Between Antung and Pyongyang

DURING the attack and for 11 days following the initial strikes, U.N. air forces controlled and denied to the enemy the use of the bridge complex area. All rail and highway traffic through it came to a standstill. Supporting attacks cut the rail and road bridges at Kunuri—a minor crossing upriver from Sinanju—completely bisecting the west coast transport network.

On 18 January, three days after the termination of the assault, photo reconnaissance noted the beginning of repair activity in the Sinanju-Yongmidong area. The enemy was observed constructing a new north by-pass (B-65) at Yongmidong. In less than 48 hours all caissons had been set in and the bridge approaches graded. On the 19th, heavy repair was noted on both complexes. All bridges were still unusable on the 20th. On 21 January, the twelfth day after the attack began, reconnaissance reported a resumption of limited supply activity through the area. Hordes of Red laborers and soldiers streamed over several hastily patched-up bridges, "back-carrying" supplies from Yongmidong to waiting trucks and trains on the Sinanju banks of the Chongchon. At night trucks were observed shuttling supplies across the frozen river surface to trains waiting on the other side. After 11 days limited supply by night once again was underway.

The anticipated disruption to the whole transportation system materialized. The assault had temporarily split the system into two parts. Critically short of supplies at the front, the enemy was forced to move supplies in daylight in spite of his fear of further air attack.

Interdiction of lines running into the bridge complex area caused heavy loadings to back up in rail marshalling yards along the Sinanju-Pyongyang line and the routes north of Sinanju to Sinuiju, Namsan-ni, and Manpojin. Rail congestions all the way up to the Yalu were noted and targeted for medium-bomber attack.

The paralysis of the rail system forced the enemy onto the highways. Vehicular traffic both north and south of the Chongchon increased both by day and by night. Long, bumper-to-bumper convoys were luscious targets for daylight armed air reconnaissance, night-intruder B-26's, and night jet fighter-bombers.

The seal-off of the corridor chain-reacted all the way to the battlefield, where the enemy ground fire dropped to a whisper. For about a week enemy forces lobbed only sporadic mortar fire at U.N. troops in doses of one or two shots at a time with long intervals between firing. This sudden drop indicated the critical condition into which the air assault had catapulted the enemy logistic situation. It revealed the minimum low level of his stockpiles at the front and his dependence upon the daily trickle of supplies received through the Chongchon corridor.

The wholesale destruction of highway and rail rolling stock and the thousands of tons of supply and ammunition—which the strike flushed into the open—was a serious loss to the enemy. But the results went even farther. Benefits to the U.N. were still being derived at the time the armistice was signed some six months later.

The lesson in air pressure was driven home to the Communists. They pulled back underground and reverted to their devious, covert system of

supply. This tortuous method could deliver only a subsistence level of materiel, eliminating any danger to U.N. ground forces of a major enemy offensive. As for the Sinanju-Yongmidong bridge complexes, once they had been wiped out in a single air broadside, the task of hindering their reconstruction and of keeping them out by routine follow-up strikes became much simpler. Following the big attack continual day and night harassment attacks were conducted by small elements of fighter-bombers. It was found that only 8 fighter-bombers by night and no more than 24 by day—armed with VT-fused general purpose bombs—could inflict maximum harassment and keep the enemy repair crews diving for cover. Daylight high-altitude dive bombing—with release point from 12,000-15,000 feet—was found to be a most effective harassment tactic, which also protected the fighter-bombers from undue danger from antiaircraft fire.

The chart indicates the status of the bridges from the January air envelopment of the bridges until the Armistice. Medium- and fighter-bomber follow-up strikes picked off the structures one by one as they again rose to span the river. Last cover, taken on 19 July, eight days before the signing of the armistice, showed all the spans unserviceable and non-operational.

Enemy Reaction: A measure of the success of the operation, the degree to which it hurt the enemy, and the effectiveness of the air weapon as an instrument of pressure in modern war was displayed in the enemy's reaction.

Quickly recognizing the meaning and extent of the air envelopment operation, the Communists scrambled to radio and newspaper. In hate-filled phrases they labeled Sinanju-Yongmidong as another example of inhuman, barbarous, and murderous action perpetrated against defenseless peoples by the United States Air Force. Throughout the war this type of propaganda reaction followed air attacks on the vital elements of enemy strength—elements which the Communists could ill-afford to have destroyed.

Yongmidong Bridge Complex Status—1953

Target	7 Jan	10 Jan	12 Jan	21 Jan	30 Jan	7 Feb	25 Feb	22 Mar	19 Jul
B-62	SV	U/S	U/S	U/S	U/S	U/S	U/S	U/S	U/S
B-71	U/S	U/S	U/S	U/S	U/S	U/S	U/S	U/S	U/S
B-63	SV	U/S	U/S	U/S	U/S	U/S	U/S	U/S	U/S
B-64	U/S	SV	U/S	SV	U/S	SV	U/S	SV	U/S
North									
B-64	SV	SV	U/S	SV	SV	SV	SV	U/S	U/S
South									
B-65	B/I	B/I	B/I	U/R	SV	SV	SV	U/S	N/C
B-65				U/C	SV	SV	SV	U/S	N/C
East									
By-pass									

Sinanju Bridge Complex Status—1953

Target	2 Jan	10 Jan	12 Jan	21 Jan	23 Jan	26 Jan	7 Apr.	11 Apr.	19 Jul
B-66	SV	SV	U/S	U/S	SV	SV	U/S	SV	U/S
				U/R			U/S		
B-74	U/S	U/S	U/S	SV	SV	SV	U/S	U/S	U/S
B-75	U/S	U/S	U/S	U/S	U/S	U/S	U/S	U/S	U/S
D-68	U/S	U/S	U/S	U/S	U/S	U/S	U/S	U/S	U/S
B-67	SV	U/S	U/S	U/S	U/S	SV	U/S	SV	U/S
							U/R		

SV—Serviceable
U/S—Unserviceable
B/I—Bridge Incomplete

U/R—Under Repair
U/C—Under Construction
N/C—No Cover

From a logistics standpoint the air assault had cracked down on the Communist military forces where it hurt the most. It had forced them to revert to their underground supply system which inched along mostly by night.

With typical swiftness the Communists moved back into the devastated area. On 18 January, three days after the termination of the assault, reconnaissance observed the enemy undertaking the gigantic task of clearing up and restoring the corridor to serviceability. By 21 January, his labor battalions were making repairs with their usual incredible speed. Photo cover on the night of 21 January revealed rail bridges B-64-north and B-64-south in the Yongmidong complex and B-74 in the Sinanju complex to be in temporary but shoddy serviceability. It was doubtful that the area between the bridges was adequately opened up to allow through rail service.

By 21 January the enemy had pulled into the corridor 214 anti-aircraft weapons—139 heavy and 75 automatic weapons, representing an increase of 44 heavy guns and 35 AW's over his ground defense weapons in the same area at the beginning of the air attack. This significant increase in anti-aircraft defense attests to the sensitive character of the corridor, the relative value of the area, even in destruction, to the enemy's military position in Korea, and his determination to build it even stronger than before.

Perhaps the most interesting reaction was the construction of a new main north-south rail by-pass which widely skirted the Sinanju-Yongmidong complex. It took the Communists only a few days to catch the meaning and significance of sustained air envelopment as a decisive form of air pressure. Marshalling thousands of military and civilian personnel into regimented labor battalions, the Communists set out at the break-neck pace of a mile-a-day and constructed a new 60-mile-long rail by-pass route. Beginning at Namsi the new main route filed through the mountains to Kunuri on the Chongchon River, then south to Chasan-ni. This new line gave the enemy two widely separated main north-south rail lines connecting Manchuria with terminal points in the frontline rear areas.

In view of the shortages in steel rails and other construction materials, this project must have represented a substantial drain on enemy resources. Sinanju-Yongmidong forced it upon the enemy—another example of the totality which air forces lend to modern war.

The Meaning

WHEN one has said that at Sinanju and Yongmidong air forces took and held for 11 days a piece of real estate of enormous importance to the enemy, what has he proved? Is it meaningful to future operations?

There are several positive aspects to the air action at Sinanju-Yongmidong. For one thing it was a *tour de force* which demonstrated the capability of aerial firepower used as persuasive pressure. There may well be occasions in the future when the military necessity of denying the enemy access to a certain area will be great enough to justify this somewhat prodigal use of air resources. Or there may be occasions when such application of air pressure will be found necessary to dissuade an enemy from his intended course of military action. If it had not been for the present repugnance against the use of atomic weapons in Korea, there can be no doubt that at Sinanju-Yongmidong the same results could have been much more easily and eco-

nomically achieved by one well-placed atomic bomb delivered by one fighter-bomber instead of thousands of tons of TNT requiring hundreds of aircraft sorties operating over a period of days.

Sinanju-Yongmidong has demonstrated that air forces can lay down a curtain of fire on a limited area and deny an enemy access to it. The size of the area has direct ratio only to air forces available or type of aerial ordnance used.

It might also be argued that Sinanju-Yongmidong demonstrated that had enough air forces been available in the early days of the war when capture and control of North Korea was the U.N. objective, air interdiction might have been decisively effective and have ended the war more quickly and on terms which offered a better promise of lasting peace. On the other hand, if after the objective had been changed to achieving an armistice, this order of firepower could have been applied along all the enemy's supply system in North Korea, air forces might have choked off that final 10 per cent of the supplies that got through to the front lines. But the cost in air resources in terms of the results achieved and in view of the larger requirement for redressing the larger problems of world-wide Communism would have been too high. No doubt Sinanju-Yongmidong was an object lesson to the Communists. It was a valuable show of strength, a lesson in military pressure through the air; temporarily it reduced ground fighting at the front to a minimum and forced the Communists to go back to a system of supply ages old. Because it could be repeated anywhere south of the Yalu at any time, it further convinced the Communists that they would never be able to sustain another general offensive—the only form of military pressure available to them as a bargaining point at the conference table.

But to have attempted a continuous air effort of this intensity throughout Korea would have absorbed the total resources of the USAF in what was, after all, only part of the air force commitment in the global struggle.

A mighty new instrument of military force and persuasive pressure available to a theater commander had again been proved. It could be decisively employed in a combined air-ground offensive strategy where isolation of the battlefield is followed by ground offensive. It could be decisively employed in its new concept—as sole decisive pressure toward the attainment of theater objectives.

The bridges at Sinanju and Yongmidong have been rebuilt. But in the gnarled steel and wrenched earth the Communists saw the specter of a new concept in war—air envelopment.

The Nuclear Backfire

Has Atomic Ignorance Paralyzed our Allies?

DR. ROBERT STRAUZ-HUPÉ

IT is difficult to fix the exact date when the policies of the United States, directed towards the creation of a strong system of European defense against threats of Soviet aggression, met mounting resistances. The year 1952 probably ended a distinct phase in American-European relations. Until then the forging of political and military unity of the West progressed fairly rapidly. Since then the tide has been running against the United States. In the spring of 1954 the European Defense Community had not yet achieved full sovereignty and the right to rearm. The reluctance of the French Chamber of Deputies to approve of a supra-national army composed of French, Italian, Benelux, and German contingents still was the greatest single obstacle in the way of West-European military integration.

In fairness to France it should be noted that the EDC project had lost ground in other prospective member countries as well, Germany being the principal exception. The disappointing outcome of the Italian elections and the ensuing political crisis affected adversely the chances of speedy ratification by the Italian Parliament. Elsewhere the opposition to EDC was less formidable or, in any case, less vocal than in France and Italy, yet it persisted and drew comfort from the French and Italian stalemates. These developments may have gravely impaired the efficacy of EDC as a

Have our European allies bogged down before the prospect of becoming the battleground for the atomic weapons of the United States and Soviet Russia to determine the course of history? Dr. Robert Strausz-Hupé, noted Professor of Political Science at the University of Pennsylvania, feels that they have. The tide of the cold war has turned against us, he says, because our European allies have abandoned themselves to fatalistic "neutralism." Proud military nations now begin to fear they may become mere auxiliaries, exhorted to strain their resources to amass conventional weapons for a struggle which is frankly geared to atomics, a form of power about which they have been told little and the building of which may be beyond their resources. How do we regain the confidence and active support of our European allies? Dr. Strausz-Hupé suggests: Set the European public straight on the basic issue—In atomic war can Europe be both defended and preserved?

means of European unity, for its implementation requires not only formal ratification but continued, unstinting public support.

Apart from divergencies on this crucial issue, American-European relations have been troubled by other controversies. The United States and its European allies do not see eye to eye on such matters as the relative immediacy and seriousness of the Soviet military threat, the Asian problems, and international trade policies. Of the other issues of American-European friction, some are trifling and could, with proper management, be removed from the agenda; others are unavoidable, arising from altered power relationships which neither the United States nor the European states can change. All these issues, large and small, are being grossly exaggerated and sedulously exploited by the communists and their hangers-on as well as by the nationalist extremists. The United States can do nothing to appease these irreconcilable factions. Their hostility has to be accepted as a constant element of the situation, no more disquieting now than it has always been. But the weakening of United States influence in those quarters where American policies have always enjoyed ready support is indeed a matter of serious concern.

This disturbing trend affecting many millions of Europeans, including many important personalities in public life, seems to be largely—though not exclusively—the result of their estimates of (1) the showing of the United States in the cold war and (2) strategic and technological developments fraught with unprecedented and drastic consequences. I do not propose to examine the validity of these estimates, a task beyond my competence. They are important no matter whether they are objectively true or false because they reflect European opinions shared by many politically influential individuals. Hence they shape European responses to United States policies. In the last resort these responses determine the extent to which the United States policy makers and military leaders can depend on the effective support of their opposites in Europe. While treaties supply a measure of such effective support, they do not disclose fully the depth of popular sentiment which is the true basis for a long-term system of allied cooperation.

The following critique of the American record represents necessarily a synthesis of many European views. Their currency can be readily ascertained by a cursory examination of the daily press, of parliamentary records, of leading periodicals, and of the opinions expressed by the man-in-the-street in half a dozen European countries.

The Chill in the Cold War

THE West based its cold war strategy on these assumptions: (1) no hot war need be fought because the United States possessed in the atomic bomb so incomparable a weapon that it could annihilate Soviet power at virtually no risk to itself; (2) the United States could maintain a world-wide system of alliances and thus consolidate the free world; (3) the United States was strong enough to cope with local military and revolutionary challenges to itself and its allies.

What has happened to these basic assumptions? The United States no longer possesses the nuclear monopoly and is itself exposed to attack. The system of alliances has stood up under severe strains, but differences of opinion left deep scars. Communist aggression did not suffer decisive defeats either in Korea or in Indo-China. In the "small" war in Korea, the mighty United States barely held its own against Asian troops relatively unsupported by air power.

The United States can recite a long list of cold war battles that it won. The Kremlin failed to capture western Europe. Berlin resisted Soviet blockade. American economic aid sparked the recovery of Western Europe and presumably saved France, Italy, and several other faltering nations from lapsing into communism. The United States launched NATO. American military aid strengthened the home-grown defenses of Europe, sufficiently, it would seem, to cause the Soviet Union to think twice before starting on a march to the Channel. Yugoslavia defected from the Soviet camp. United Nations forces repelled aggression in Korea, although the costs to the United States were extreme high. But have these successes brought the United States nearer to its goal?

The Western purpose in the cold war, one must presume, was to win. Or if this seems too immodest an objective, to wage it so that after years of considerable financial and military efforts the United States would be stronger in relation to the Soviet Union than it was at the start of the campaign. Has the United States won at least an advantageous stalemate? Can it confidently expect the ultimate discomfiture of aggressive communism or at least a prolonged period of security for the free world? If the answer to these questions is "yes" it would have to be based on a change in Soviet intentions. If the Soviet Union has abandoned the plans of world conquest, then a stalemate might be the overture to peace-with-security.

But the U.S.S.R. would be casting aside theories and practices

which raised it from a furtive conspiracy to lord over 800 million. If the Soviet Union has not experienced so profound a change of heart, then the West must look to its own accomplishments and ask itself the agonizing question: might not the present stalemate be the pause before another and even greater trial of strength? The hardihood of the communist parties in France and Italy despite sensational post-war economic improvements, the creeping advance of communism in Guatemala, British Guiana, and Indonesia, and the spread of an ambiguous anti-Western nationalism throughout the Middle East do not encourage hopes for a calm future. If American cold war strategy of deploying military and economic means has succeeded in stopping the Soviet advance frontally, it has failed to halt the flanking attack of Soviet ideological and political warfare.

Europe Studies the Shifting Balance of Power

AFTER seven years of cold war the United States is *not* stronger in relationship to the Soviet Union than it was at the start of the cold war campaign. For a time after World War II the American atomic monopoly did deter the Soviet Union from exploiting the weakness of Western Europe. At Berlin the communists drew back. The key to Soviet foreign policy from Hiroshima to Korea was counter-atomic. The objectives were (1) to prevent the United States from using its monopoly as a diplomatic aid and, as a last resort, as a military weapon; and (2) to exercise maximum pressure upon the free world without provoking atomic retaliation. In this policy the Kremlin succeeded brilliantly. Skillful communist propaganda heightened the confusion reigning in the Western camp. It seemed as if the American people were more afraid of their dread weapon than those who did not possess it. Soviet technology, aided by espionage, closed the critical gap opened by the United States atomic headstart. The United States at last acknowledged itself vulnerable to Soviet nuclear attack. In other weapons the Soviet bloc has certainly not grown weaker. China has emerged as a major military power. In Korea and Indo-China, the West has not won decisive victories. Because the communist bloc has grown stronger, its leaders can afford small concessions to their peoples' craving for consumers goods. The cold war has not weakened the Soviet regime. Quite to the contrary, the Soviet leaders proceed from strength when they offer deals to their own peoples and to the rest of the world.

On May 11, 1953 Sir Winston Churchill called for a conference

with the U.S.S.R. "on the highest level." President Eisenhower, speaking on December 8th to the United Nations, dwelt on the horrors of nuclear war and called for nuclear armament reduction. Both statements acknowledged the change in the world balance of power. The scheme for a European Defense Community has been hanging fire, chiefly because the European masses are unwilling to wage war at prohibitive nuclear odds. The meeting of the NATO powers, in December 1953 was reported by the press to have reviewed the changes which new weapons techniques suggest in NATO's strategic arrangements. President Eisenhower's address to the United Nations stressed the progress made in raising the power of nuclear explosives.

NATO's review of strategy and the President's speech signified a new phase in the relationships between the United States and its major allies, especially toward the Franco-German problem which is the crux of European defense. If France ratifies the EDC treaty Germany will be permitted to rearm and bring 12 divisions into the European army. But here the average citizen of France and of the other countries in Western Europe is left to grope amidst a mass of contradictory statements for even the simplest facts.

The new thermonuclear weapons, he has been told, can be used tactically to destroy whole armies in the field. Then, he may ask, will 12 German ground divisions contribute to European defense if nuclear weapons put the value of land armies in doubt? Is there room enough in so narrow a theater of war as Western Europe for dispersing large ground forces? And if there were room enough, could ground forces so dispersed defend the ground they are supposed to hold? A rumor, widely current in Europe, alleges that Sir Winston Churchill's quest for an East-West settlement by four-power conference was prompted by the opinion of British experts that the British Isles are indefensible against nuclear attack. Although this rumor may be baseless, the average Englishman may infer from President Eisenhower's United Nations speech that the prospects of the tight little island under nuclear attack are not exactly encouraging.

The French have been severely taken to task because they persist in fumbling the ratification of the EDC treaty. The arguments of the French opposition to EDC—opposition which cuts across all political parties—are: (1) that the Soviet Union did not attack when the NATO army was much weaker than it is now, so the German contingent is not needed; (2) that in an all-out war Europe will be wiped off the map by nuclear attack anyway and

that it will matter little if 12 German ground divisions are added to an army doomed from the start; and (3) that for these reasons the 12 German divisions will serve no purpose other than to provoke the U.S.S.R. or to entice the Germans to throw their new weight around *within* the Western community by bullying their weaker neighbors, and to seek, in the fullness of time, a separate arrangement with the Soviet Union on the patterns of the Rapallo Treaty of 1922 and the Ribbentrop-Molotov agreement of 1939.

These arguments may be foolish and may be designed chiefly to save France the pain of making an honest and expensive contribution to the defense of the free world. But if the French public infers from the President's statement that there is no feasible defense for Europe against thermonuclear attack, then the reluctance of the "neutralists" to expose their peoples to unrequited slaughter rests on more respectable grounds than mere cowardice, sloth, and insensitivity to the menace of communism. That the United States possesses the retaliatory power to punish Soviet aggression after Soviet bombs have atomized the capitals of Europe may appeal to some Europeans' sense of poetic justice. But retaliatory power would be a mere postscript to the end of European civilization.

This popular estimate of the military situation carries all the more conviction because it bears out the average man's intuitive understanding of changed power relationships: he feels that the scale of intercontinental war is so vast that no European country can participate on the basis of military equality. No European country can hope to develop all the weapons and strategic resources that would allow it to cut an impressive figure by the side of the two major powers. This is a bitter pill to swallow for ancient military nations which only a few years ago could exercise their sovereign discretion in matters of peace and war. This feeling of having been relegated to the rank of military auxiliaries, able to afford only yesterday's modern weapons, has been a strong deterrent to purposeful and enthusiastic effort ever since Europe's post-war rearmament began. It has been greatly strengthened by disclosures about the huge manufacturing costs of atomic bombs and of the devices required for their delivery upon targets.

In those European countries still controlling large colonial territories, awareness of their economic, spatial, and therefore military limitations has made them preoccupied with what remains of their respective empires. These imperial preoccupations are all the more intense because they compensate psychologically for a sense of enfeeblement in the defense of the home country.

Yet it is precisely in colonial territories that communists cold (and hot) war strategy has registered its most notable successes.

Europeans feel themselves frustrated in both directions—in their desires to play an independent role in European affairs and in their hope of escaping their strained circumstances into the more spacious world overseas. It is only human that they should blame this impasse upon the cold war in general and upon the United States in particular. For the United States does possess the weapons and strategic resources now beyond the means of Europe. The tensions created by this disparity are not lessened by the fact that the United States is somewhat less than sympathetic toward European attempts to compensate for weakness in Europe by clinging to colonial possessions.

The Need: Facts of Atomic Life

LET us concede that some excellent arguments urge Western Europe to build a proper military posture and face up to the threat of Soviet aggression no matter what costs and risks such a course may entail. Let us also concede that strong argument could be advanced to disprove these arguments. Certainly the first position would be infinitely stronger if it were backed by a plain statement of the military facts of the European situation in the light of nuclear developments.

As matters now stand Americans should admit in fairness that much of what looks like bumbling confusion and feet-dragging in Europe is nothing but the bewilderment of politicians and populations befuddled by ignorance and uninformed speculations. EDC is, in my opinion, a necessary step towards European integration. It is the best solution yet advanced for associating the German people with the fortunes of their West European neighbors.

But what will a European army be worth if the peoples that are supposed to man it see themselves as sure candidates for incineration before or after United States retaliatory power has incinerated the Soviet population? In this age of prodigious scientific progress, people not only want to know what they are fighting for, but also what they can fight with and what technological surprises the enemy may have in store.

The peoples of Europe have only the haziest notion of what their fighting chances are in nuclear war. They are frightened; they have been told little and that little has been told incoherently. If the United States wants loyal allies—that is, as long as American foreign policy hinges upon a system of alliances—then the United

States must forthrightly tell its friends not only what they are expected to do but also what will be their chances of doing it *and* surviving. We may confidently assume that President Eisenhower's proposal for sharing knowledge about atomic technology with allied states was inspired in part at least by awareness of Europe's need of psychological assurance.

No one expects that the United States Atomic Energy Commission should take French communist deputies on guided tours through its plants. Enough fragmentary information has been disclosed officially so that, properly assembled and authoritatively interpreted, it could set the European public straight on the basic issue: can Europe be defended or is Europe the expendable adjunct to a United States strategy of retaliation?

It may be argued that the United States has a better grasp than its uneasy European allies on the over-all strategic situation and that the latter's views should therefore be ignored until events prove the wisdom of American conceptions. Furthermore it may be argued that the psychological distress of large masses of Europeans is not sufficient reason for altering American political and military strategy or for compromising the latter's success by disclosing any information whatsoever. These arguments may be indeed so well taken that they preclude that measure of frankness which could materially strengthen European morale.

But before the United States makes any such decision, it should consider very seriously the implication carried by the European "estimates" of the trend of the cold war. A good deal of what seems enigmatic about European diplomacy and political debate is based on a simple European assumption concerning the prevailing military balance. The assumption is that the United States and the Soviet Union have reached a point in weapons development where neither side can gain a military victory. Thus the opposing military forces have cancelled each other. Since the United States has lost its military edge, the odds now favor the communists because they are old hands at political warfare.

This view too may be based on inadequate appreciation of all the facts. But it represents that hard core of Europe's "neutralist" thinking which requires, from the point-of-view of the United States, the most searching second look. Indeed communist doctrine supports the belief that a long drawn-out military stalemate, enlivened by ideological and political warfare, suits the communists best—at least for the foreseeable future. Neither a lessening of Soviet pressure upon peripheral areas nor even a slowing up of arms production indicate a lessening of Soviet aggressiveness.

What they do indicate is a transfer of emphasis from one level of conflict to another one.

Europe's skeptical critique of United States performance in the cold war may err on the side of pessimism. However galling some of its negative conclusions may be to our pride, they cannot be ignored simply because they fail to confirm our own evaluation. Perhaps the results of our efforts do not warrant as much optimism as we are temperamentally prone to exhibit. Much has been achieved, especially in Europe. But the Soviet Union remains the same formidable opponent it has always been. And complacency and self-deception are still the most dangerous enemies of democratic peoples.

University of Pennsylvania

As we move to save Southeast Asia . . .

. . . what can we apply from our experience in Korea?

The Korean War Speaks to the Indo-Chinese War

A Quarterly Review Staff Study

ONCE again Communist aggression in Asia menaces the free world. Again the free nations grimly face the problem of how and in what degree to respond to the challenge. Not as clear-cut as was the sudden Communist onslaught across the 38th parallel in June 1950, the creeping-paralysis technique in Indo-China is just as deadly. Possibly the greatest deterrent to action by the free nations is the conviction, based partly on the results in Korea, that limited action in Indo-China means another costly, bloody stalemate ending in an unrealistic settlement producing little more than armed truce. More positive action—action against Communist China, source of aggression—is disturbing because of the traditional idea that a large land power must be dealt with by masses of ground troops. This kind of action against the vast bulk and manpower of China would be a major war with appalling casualties. It would leave the U.S. exhausted and the main threat, the U.S.S.R., still to be dealt with.

To many persons in the U.S. Air Force the Korean War carries other lessons. This article will attempt a summary of some of the political and military factors in the Indo-China war as against those of the Korean War, bringing to bear some of the implications of the Korean experiment in producing political terms by means of air pressure.

The events of the past year in Indo-China, which have seen the Chinese Communists step up their support of the Vietminh Communist forces in Indo-China, have done much to clarify the Communist master plan for aggression in Asia. Soviet Russia, the brain and driving force of world Communism, seems to have delegated the exploitation of Asia to Communist China. This assignment has fitted perfectly into the plans of the Chinese Communists. They desperately need a heavy industry system of their own to equip their growing war machine and to reduce their reliance on Soviet logistic support, thereby strengthening their bargaining position within the Communist bloc.

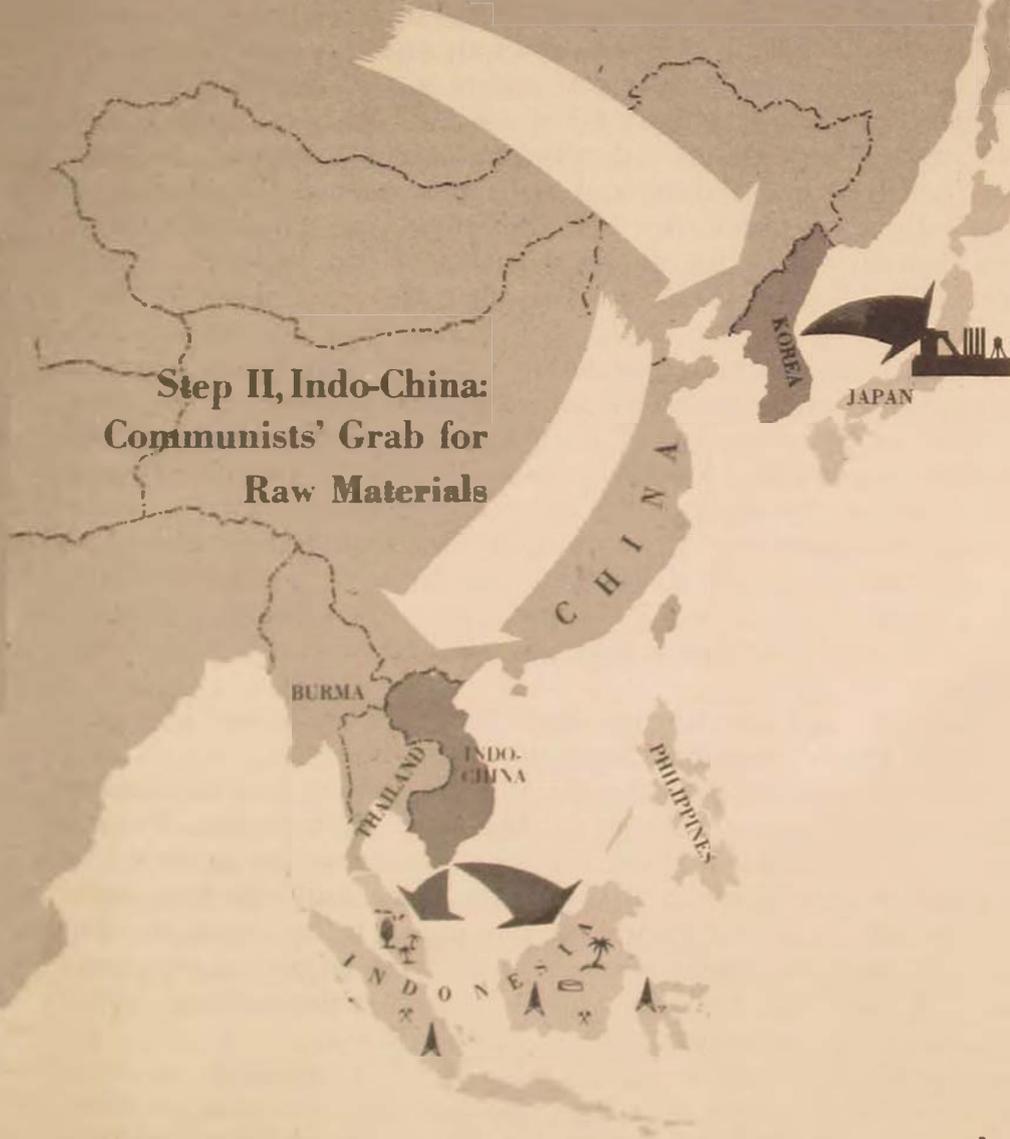
In 1950 the quickest and easiest way to acquire heavy industry seemed to be by way of Korea. Since the Communists believed that the United States would not defend South Korea and that the U.S. was showing signs of withdrawing from Japan, they saw an opportunity to annex South Korea. This would complete the land encirclement of Japan and provide an easy

Aggression in Asia

U. S. S. R.

**Step I, Korea:
Communists' Grab for Industry**

**Step II, Indo-China:
Communists' Grab for
Raw Materials**



Legend

- Immediate Objective 
- Ultimate Objective 

springboard for its infiltration and subversion. If Japan could be brought under Communist domination, its substantial heavy industry and large reservoir of skilled manpower would be an acquisition rivaling in importance the previous conquest of China itself.

U.N. military action blunted and then crippled this drive. The Chinese Communists threw their own forces into the battle and taxed their logistic system to the utmost, so great was the prize. But U.N. air forces took a relentless toll of troops and supplies, even under the restrictive decision that confined air operations to Korea. When it became apparent to the Communists that they could not hope to amass the logistic support for another sustained ground offensive, they reluctantly came to terms.

The failure of this "get-rich-quick" grab for Japanese industry forced the Chinese Communists to revise their plans drastically. By the end of 1953 they had decided to follow the Soviet example and build their own heavy industry. Their thoughts now turned to the raw materials and minerals they would need in their development program and afterward to feed the heavy industry they had constructed. Southeast Asia filled the bill. Rich in minerals and oil, it would make China almost self-sufficient in raw materials. Seething with a new fervor of nationalism and with resentment of memories of Western colonialism, countries like Indo-China, Burma, Thailand, Malay, and Indonesia appeared ripe for the combination of cunning political and economic persuasion and guerrilla warfare that had operated with such success in China.

The war between the Vietminh Communist forces and the French-Vietnam free forces had flared and smouldered spasmodically for seven years. Now it assumed a new importance in the Communist scheme. Like Korea, Indo-China had some importance for its own sake. But its chief value was as a gateway to the rest of Southeast Asia. Chinese Communist support of the Vietminh forces was increased. More cautious after their lack of success in Korea, the Communists moved slowly and quietly, so as not to alarm or provoke the rest of the free world. Military pressure mounted gradually, with ebbs and flows calculated to belie the strength that lay behind the "guerrilla actions."

But the free world has also learned from Korea. The Korean War had ripped away the facade masking Communist intentions in Asia. It had helped crystallize the awareness among the Western powers that any further Communist attempts at encroachment in Asia must be met with firmness and resolution. In the United States this new awareness has extended to a further realization that peace in Asia will not come until the free world has wrested the initiative from world Communism. It has made it clear that further aggression, no matter what its guise, must be met at the place, at the time, and with the weapons which the free nations choose rather than by dancing to the Communist tune in another Korea.

In the immense strategic value of thwarting the first phase of the Communist drive for power in Asia and in the political and psychological value of the new awareness among free nations as to the nature of the Communist threat, the Korean War has already paid for itself, bloody and costly though it was. As the free world draws together to meet the grim threat in Indo-China, Korea offers other lessons, both political and military. It is the purpose of this article to draw attention to some of the outstanding ones, either in comparison or contrast, and briefly to place them in context of the new struggle.

Indo-China: Land of Conflict and Compromise

THE name "Indo-China" correctly summarizes the basic structure of this strife-torn country. The long boundary line which runs down the spine of the Annam Cordillera and divides the states of Laos and Cambodia on the west from Vietnam on the east marks the high tide of outward movement of the great civilizations of India and China. The old Khymer empire of Cambodia, at its height from the 9th to the 13th centuries, included the Mekong River basin and much of modern Siam (now Thailand). The famous buildings of Angkor were built by its emperors, and its ruling classes were from India. Under pressure from the Thai people, who moved down from China, Cambodia weakened and from the 15th century was tributary to Siam or to its neighbor Annam (now Vietnam) until French intervention in 1863.

The kingdom of Champa, also Indian in influence, occupied the middle of the peninsula until defeated by the Annamites late in the 14th century. Its influence is still found in southern Laos and southern Vietnam.

Northern Vietnam became part of the Chinese Empire in the 2nd century B.C. In the thousand years before the Annamites regained their independence, Chinese culture became firmly imbedded in their civilization. The vigorous Annamites moved down the east coast as militant colonists, conquering lands, driving out the inhabitants, and then settling on the land. By the time of the appearance of the French the Annamites had worked down as far as the present southern boundary between Vietnam and Cambodia.

European traders and missionaries began appearing in Indo-China in the 16th century, but not until the 17th century did any of them gain important influence. Then the support of a French missionary enabled one of the Annamite rulers to weld the eastern provinces into the present state of Vietnam. In gratitude the king formally established commercial relations with France. But his successors were less fond of French influence, and relations deteriorated until in 1858 a combined French and Spanish fleet moved in and captured Tourane, then went on to take Saigon. Cambodia became a French protectorate in 1863, and Vietnam in 1885. By the end of the 19th century these states were grouped together with Laos under the name of Indo-China Federation, an artificial creation of the French.

During the Second World War, when French power and prestige had weakened, Indo-China began to come apart. After the Japanese occupation troops surrendered in 1945, Annamite nationalists led by Ho Chi Minh, a Communist leader of the "Nationalist" movement against the French, declared Vietnam to be independent. Cambodia and Laos remained in the French Union.

Trouble soon arose between the French and the new leaders in Vietnam. Cochin-China, the southern tip of Vietnam, had been controlled by the new Vietnam government at the end of the war, but in the autumn of 1945 the French had taken it over again. The leaders of the Vietnam political party, the Vietminh, demanded the return of Cochin-China, and fighting broke out. In March 1946 a truce was signed in which Vietnam became independent within the French Union, and a referendum was set up to decide the status of Cochin-China. A month later negotiations broke down again. In June, before the referendum could be held, the French commissioner set up a provisional government in Cochin-China, and the Vietminh claimed the agreements had been violated. Fighting was resumed in December 1946 and the war still continues. In May 1948 the French set up a provisional government for Vietnam with the former emperor of Annam, Bao Dai, on the throne. In 1949 Cochin-China formally joined the state of Vietnam.

The Political Context

THE political situation in Indo-China is much more critical to the solution of the total problem than it was in Korea. This is true not only because political and governmental organization in Indo-China is more complex and strife-torn than in the Republic of Korea but because the Communist military action differs in nature. The attack on South Korea came from one direction, across an established border, and in the form of an organized army. The war in Indo-China is for the most part a guerrilla war, scattered in patches over the length and breadth of the land. Guerrilla warfare as fought by the Communists owes its existence and draws its nurture from the discontent and misery of the people and from inadequate steps by established government to relieve political and economic ills. That the Communist political propagandist is frequently to be found in villages far in advance of Communist troops shows the importance the Communists attach to predisposing the natives toward their cause.

Since this is true, it is obvious that the only real, permanent solution to the Indo-China war must be a political one. The basic problem is to devise a political independence for the states of Indo-China acceptable both to the French and to the Indo-Chinese. Only such government can rally the support of the many anti-Communist elements in Indo-China who have so far refused to do business with France or with the Vietnam government headed by Bao Dai. Any solution which settles for less than this will give the impression in Asia that the U.S. is merely supporting French colonialism. It will mean a war fought in the midst of an indifferent or hostile population, in which a large military expenditure will by brute force produce a sullen truce rather than a lasting, stable peace. The new governments must also be supported by the free nations in a series of economic and social programs that will offer positive, concrete alternatives to the effective if phony promises of Communism.

Two other qualifications complicate the political situation. In Korea the difficulties encountered in dealing with President Syngman Rhee were more than offset by his influence over the people of South Korea and by the firmness with which he ran the government. If there is now a Syngman Rhee in Indo-China, he is on the other side in the person of Ho Chi Minh. A hero from the Communist "nationalist" movement against the French, Ho Chi Minh is widely identified with Indo-China's drive for nationalism. Because of his leadership the Vietminh forces are able to pose as fighters for Indo-China's independence. The second factor is that Indo-China cannot be considered one national entity in the same way as can Korea. The states of Vietnam, Laos, and Cambodia have different racial, religious, and economic views. The long, turbulent history of the Balkans demonstrates that such problems are not solved by blandly imposing arbitrary government structures and boundaries which ignore these basic realities.

The Strategic Military Context

China. China's position in an enlarged war in Indo-China would not be nearly as favorable as it was in the Korean War. Her difficulties would be largely economic and logistic. Since the Korean War Communist China

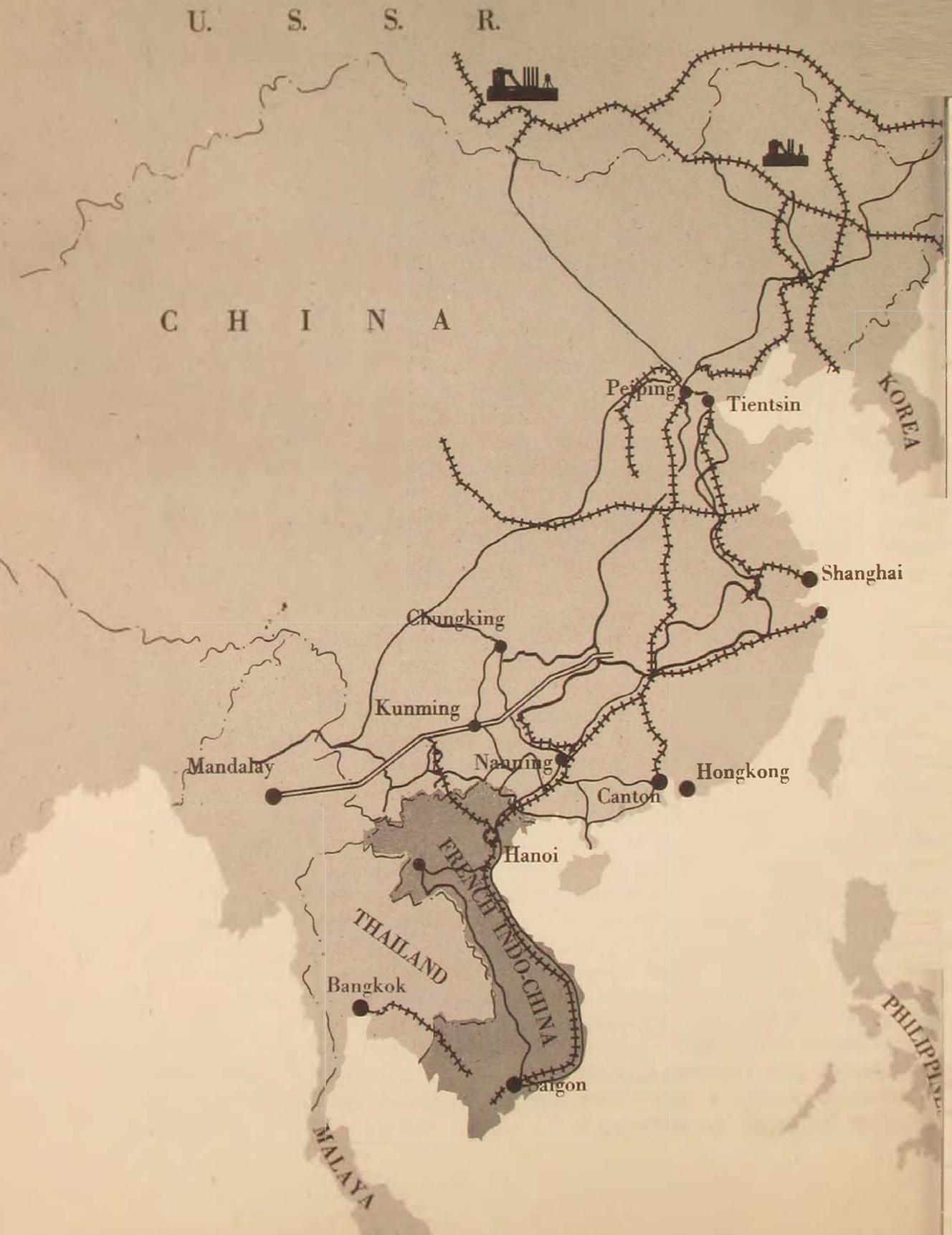


Since 1945, Indochinese Communists have assiduously played on their war-time identification with the resistance movement. When the Japanese surrendered, the Communists merely transferred their campaign to the theme of liberation from the French. Towns in Indo-China were littered with signs like the ones in this photograph. Throughout Asia, Communism has cloaked itself in the guise of nationalism.

has committed herself to a massive five-year plan for building up a base of heavy industry. This tremendous effort will drain her economy for years. If the program is to carry forward, other large capital outlays must be avoided as must attrition of precious war material.

Even more of a problem is the logistic support of an enlarged war in Indo-China. The war would have to be supported largely from the same industrial sources that supplied the Communist effort in the Korean War. Most of the supplies would have to come across the long lines of the Trans-Siberian Railroad and then be carried far south into China. China-produced munitions would come from the industries of Manchuria. But delivery to Indo-China from either source would add 1500 miles to the supply line that went into Korea. The transportation system to be traveled is not nearly as adequate as the one crossing Manchuria to Korea. To the south the Chinese rail system thins out. From Chunchou to the border of Indo-China, some 600 miles, there is only one railroad, with no parallel systems. The highway system is primitive, but it remains the chief means of conveyance to the Indo-Chinese Communists. Sea and inland water transport is available to the Communists and there appears to be some pressure from the Communist Chinese government to make more use of it to reduce the number of trucks required for supply by road.

Communist Lines of Supply to Indo-China



While in one sense the presence of foreign troops on her southern border would be less bothersome to China than was the threat of their presence along the Yalu, in another it would be even more dangerous. Korea was close to the bulk of China's industry located in Manchuria. That industry had to be protected. In South China there is little industry, but this area contains perhaps the most delicate internal political problem in China. The bleak mountainous reaches of Kwangsi and Yunnan provinces harbor the most active and powerful guerrilla resistance to the Chinese Communist government in all China. In spite of intensive efforts by the Communist Army to stamp out the sparks of insurrection in South China, there are still hundreds of thousands of active anti-Communists operating in the mountains. Both of these provinces border on Indo-China. The Chinese Communists would not be happy to contemplate free forces at the Indo-China border in a position to supply and encourage this guerrilla war in China's own back yard.

The free nations. Aside from the massive political dilemma that also shaped the peculiar character of the Korean War—the fact that Communist China is the source and the logistic backbone of the aggression and that particularly from an air standpoint the only effective and economic way of ending the aggression is to cripple it at its source—the largest new problem faced in Indo-China is that of welding complex political and military groups, some of them with radically different objectives, into an effective fighting force. As will emerge in consideration of Indo-China's terrain and climate, Indo-China is no place to fight a ground war. This would be true even if the enemy did not rely on guerrilla tactics and if the white man was welcomed by the native population. With these additional complications, a ground campaign becomes politically unsound and explosive, as well as militarily costly and difficult. More so than any of the other open conflicts with Communism, the war in Indo-China is a battle for men's minds and men's allegiance. In a country where anti-Communism is almost overshadowed by anti-French feeling and where every white man is considered an automatic ally of French domination, the deployment of American ground troops in Indo-China might well tip the scales in favor of the Communists. It seems increasingly clear that, once the political solution for Indo-Chinese independence has been found, the most appropriate as well as the most economic military assistance that could be lent by the free nations would be air action supported by a sea blockade, with necessary ground action to be undertaken by retrained Vietnam troops, supported by the then "decontaminated" French.

Indo-China, like Korea, is a relatively primitive country in terms of transportation facilities and industry. Therefore a more adequately built-up staging area and rear-echelon support base is as highly desirable for military operations in Indo-China as it was for Korea. What Japan offered for the Korean War the American bases in the Philippines could offer for Indo-China. Since the distance to the Philippines from Indo-China is more than twice that from the bases around Seoul to Japan, and since Clark Air Force Base at Manila would have to do the work of several air bases in Japan, more of the rear-echelon work would probably need be done on the existing French air bases in Indo-China than was required in Korea.

For water transportation Indo-China is more expensive in its shipping

requirements than was Korea, largely because the main shipping lines in the Pacific do not flow in that direction. Most of the ships sent to that area would have to be diverted from normal shipping lanes and would for the most part return empty.

If the other countries neighboring on Indo-China follow Thailand's lead in supporting the collective defense system under development in the area, limited base support might become available in these areas.

In general, then, Indo-China would be a more difficult place than Korea to wage war from a strategic and logistic point of view for both Communists and free nations. But compared with Korea, the added difficulties seem to weigh more heavily against Communist China than against the free nations.

Terrain and weather. The terrain and the geographical situation of Indo-China present an intensified version of the problems encountered in Korea. Both are peninsular lands, long and narrow in shape. Indo-China is considerably larger than Korea—285,000 square miles to 86,000 and roughly 1000 miles in length compared to 600. The interior of both countries is mountainous, broken only by river gorges. In Indo-China the mountains range from 3000 to 10,000 feet. In general they are slightly higher than the Korean highlands and have much vertical development. Consequently the stream valleys are narrow with sheer walls forbidding easy access to the surrounding country. Along the eastern coast a narrow strip of flat land reaches 15 to 30 miles inland from the sea. The two great rivers are the Red River in northern Vietnam, the large delta of which is the site of Hanoi, the French military headquarters, and its seaport Haiphong, and the Mekong, which rises deep in China, forms much of the boundary between Indo-China and its western neighbor Thailand, and fans out into a large peneplain in Cambodia. Saigon, the seat of Vietnam administration as well as the French Union military headquarters, is on the delta of the Mekong.

Land travel in Indo-China is further complicated by the rain forest and monsoon forest that covers all but 14 per cent of the total area. Tropical in the southern part, sub-tropical in the northern part, the lush, dense growth blankets everything except the narrow coastal strip, the two large river deltas, a few plateaus, and scattered, laboriously-cleared farming areas.

Indo-China is one of the few parts of Asia lying in the path of both the winter and summer monsoons. The winter monsoon is relatively mild. Lasting from October through March, its winds are generated by the large semi-permanent high-pressure area that builds up over southern China in the winter. The winds blow from the east or northeast, picking up moisture as they pass over the Gulf of Tonkin. From mid-January through March they produce 10 or more inches of rain in the northeastern section of Indo-China around Hanoi and along the coastal strip to a point some 100 miles below Tourane. Another product of the winter monsoon is the crachin, a local phenomenon in the northeast that produces two-to-five day periods of intense fogs, drizzle, and low clouds. West of the mountainous backbone that divides Vietnam from Laos, Indo-China is comparatively dry and has good flying weather during the winter monsoon.

The summer monsoon, generated by the "heat low" over southwestern Asia, lasts from June through September and produces winds from the west and southwest. During this period the southern and western parts of the

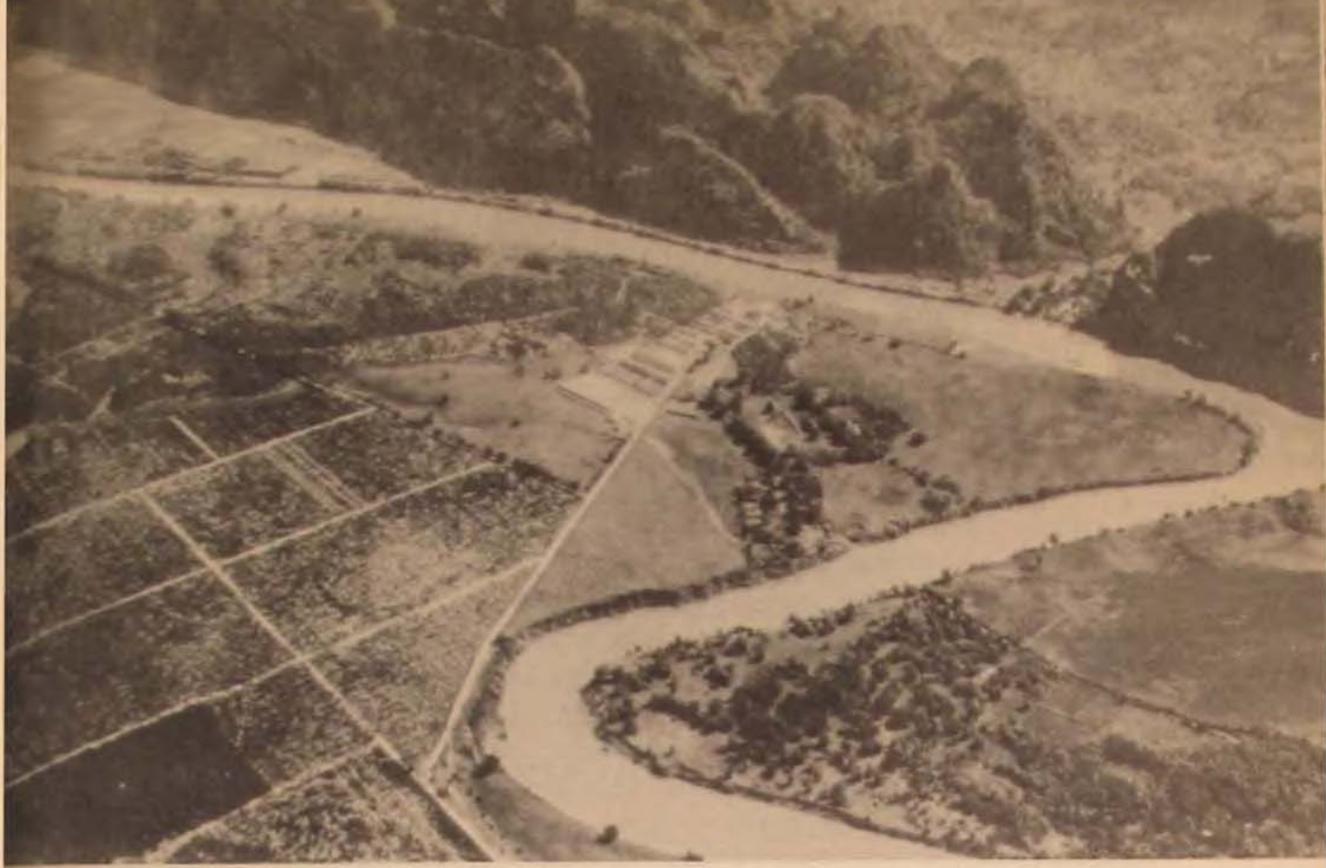
Indo-China: Relief and Transportation





The northern part of Indo-China, where the war is being fought, is a land of precipitous coastlines, steep mountains bristling with heavy forests, and intensely cultivated flatlands in the narrow river deltas. The photo above shows a part of the serrated limestone pinnacles which guard the northeastern coast along the Gulf of Tonkin. Below, a stream cascades down the steep mountain slopes in Laos, as the dense jungle presses darkly in on the sides. On the top of the opposite page is shown one of the deep bends in a river in northern Vietnam. The cultivated fields in the foreground are part of the flat delta that the meanderings of the river have gradually carved out of the limestone massifs shown in the background.





country are drenched with heavy rains, with less precipitation in the northeast and along the northern coast. Thunderstorms are frequent and intense. The southwest slopes of the Annam range are particularly wet, receiving up to 45 inches of rain from June through August.

Between the two monsoons are the transitional seasons of spring and autumn, characterized by generally clear weather punctuated with short, intense thunderstorms. From July through September the northeast and east coastal plains are endangered by an average of four of five typhoons, most of them originating in the Pacific Ocean off the Philippines.

Warmest temperatures average 95 degrees at the lowland stations and 70 degrees in the highlands. Coldest temperatures range from 65 degrees in the lowlands to minimums of 40 degrees at the mountain stations. Relative humidity remains high the year round—70 per cent in the dry season, 85 to 95 per cent in the wet season. Average yearly rainfall varies from 25 to 217 inches in different parts of the country, with most parts receiving 50 to 115 inches.

The combination of the sharp-sloped mountains, the heavy, extensive foresting, and the heavy rainfall makes Indo-China peculiarly unsuited to modern ground warfare. These natural barriers have restricted the modern transportation system to an even more primitive network of railroads and all-weather roads than existed in Korea. Most of the other roads and trails are streams of mud during the rainy months. Mountain passes are narrow and steep, easily defended by a few men. Few of the roads will support modern vehicles. The roads in the interior are narrow ribbons flanked by almost impenetrable jungle, so that convoys are easily and constantly subject to ambush by relatively small forces.

In the delta and coastal flatlands, most of the land is converted into rice paddies. Soggy with repeated flooding, laced with small streams, dikes, and ditches, and many inches deep in water or mud during the rainy season, they are practically impassable to wheeled vehicles. In the uncultivated flatlands, grass standing six to eight feet tall is excellent camouflage for guerrilla troops.

Little of the coastline offers landing places for profitable amphibious assaults. Except for the ports which the French already control, the coast line is protected by fringe islands, shallow water, mud flats, and swamps. An exception to this is the area of broad sandy beaches along the central east coast, but here the coastal strip goes inland only 15 to 30 miles. Then the mountains rise up in an unbroken mass, with no river valleys to afford ready access to the interior.

The combination of natural barriers and heavy rainfall offers little encouragement to a land campaign. Even an air campaign would be difficult during the monsoon seasons, but with careful selection of flying areas, limited operations could continue almost throughout the year.

The Military Forces

Communist. The Vietminh Communist forces are reported to total some 300,000 troops, divided into three broad categories: regulars, 120,000; regional forces, 75,000; and People's Militia, 105,000. The training, armament, and morale of these forces is in the order of priority in which these forces are listed. The regulars are the shock troops. Regional forces are less well armed but ably support the regulars in actions up to battalion strength. The militia are "minutemen," poorly armed but performing damaging small-unit work in sabotage, intelligence, and terrorist activities. They are very hard to track down since they can merge into the local population.

Until 1950 the Vietminh forces were poorly equipped and loosely organized guerrilla troops. Avoiding pitched battles, they contented themselves with preventing the extension of French-Vietnamese control. In order to form better disciplined forces that could meet the Franco-Vietnamese on their own terms, the Chinese Communists began setting up training centers in South China for Vietminh troops. The previous loose battalion structure was consolidated into divisions; the troops were trained and reequipped. By March 1952 the Vietminh had a hard-core striking force of six infantry divisions and one artillery-engineer division. Since then the training program has continued on a reduced scale.

In addition to training the Vietminh forces, the Chinese Communists are reported to have thousands of advisers and technicians in Indo-China. Some of the recent improvement in Vietminh planning and preparation is probably due to the Sino-Vietminh joint staff which has been set up at Nanning, China, some 85 miles northeast of the Indo-China border. This staff is reported to have Soviet advisers.

Vietminh strategy in general follows the classic line for struggle in Asia as laid down by Mao Tse Tung. The progression of conflict is from guerrilla warfare, through an intermediate phase, to the full counteroffensive. In all phases guerrilla warfare is the key, and in turn the key to guerrilla warfare is popular support. As in China, Communist propaganda in Indo-China has stressed the interrelationship of the army and the people. The guerrilla

is in a real sense the link between the army and the people. Many individuals continue for years as guerrillas one day and civilians the next. The Communists encourage this close identification of the people with the struggle in every possible way. Soldiers are strongly inculcated with respect for civilian property and rights. Every advantage is taken of the factors that weaken anti-Communism among the people: the inability of the Vietnamese to protect the civilians even in their own areas; the seeming endlessness of the struggle; the widely accepted view that the Bao Dai government is a "front" for the French; and the Vietminh's role as the "liberator" of the colonially oppressed Indo-Chinese.

Tactically the Vietminh forces employed the raid and the ambush offensively and the delaying action defensively. Relying on complete and detailed intelligence, the Communists launch surprise attacks and count on speed of maneuver and deception to enable them to withdraw safely. Until the attack on Dien Bien Phu they had largely avoided pitched battles, and even here they followed their precept of never attacking unless they have the superior force. They travel light, choose covered routes of approach and withdrawal, move in small groups to selected assembly areas, camp a safe distance away from crossroads, river banks, and other conspicuous sites, and move their camps every 48 hours, or under pressure even every 12 hours. These guerrilla activities differ from the traditional conception of independent groups choosing their own targets. All bands are directed and coordinated from the top of the command chain. The cumulative effect of hundreds of such raids is devastating.

The strategy and tactics largely dictate the manner in which the logistics problem is handled. Supplies come from China by truck convoy, by train, or by boat. They are then dispersed to small, well-concealed supply dumps located in natural caves, in the forest, or in deep, narrow valleys. As the tempo of the war has quickened and the size of the fighting unit has grown, the supply dumps have become larger and more difficult to conceal. But it remains a very difficult problem to locate them in the endless stretches of dense jungle and amid the rows and rows of monotonous mountains.

Free forces. The French and Vietnam forces are reported to total something over 500,000 troops. Of these the French Expeditionary Corps accounts for approximately 175,000, the Associated States Armies 150,000, the Associated States National Guards 35,000, and assorted semi-military troops some 140,000. Two thirds to three quarters of the total strength is stationed in Vietnam, by far the most explosive of the three Associated States.

In addition to ground troops the French Air Force and the Naval Air Force are reported to have some 500 to 600 aircraft in Indo-China. Of these some 400 to 450 are what might be termed mission aircraft. Flying from airfields near Hanoi, Haiphong, Hué, Tourane, and Saigon, F8F's and B-26's have been used in strikes against Vietminh positions, while C-47's, C-46's, and some C-119's on loan from the U.S. are used to furnish the large airlift requirement. One light aircraft carrier comprises the French naval air contribution. Some 200 American Air Force personnel are temporarily on hand to provide maintenance for the C-119's. French air personnel total approximately 10,000. French naval strength, in addition to the aircraft carrier, includes gunboats, submarine chasers, minesweepers, amphibious craft, and various auxiliary and service craft.



These rather muddy photographs show some of the Vietnamese troops in action against the Communist forces. Both emphasize the essential guerrilla nature of the fighting. Above, two Vietnamese defend a street corner against lurking Vietminh guerrillas. Below, a squad of irregulars is about to move out into the jungle on one of the countless patrols so essential to alert defense against guerrilla forces.





In the strong Vietminh areas of northern Vietnam, the French strategy has been to maintain forts or strongholds in the midst of enemy-dominated country. From these bastions patrols fanned out into the jungles, destroying supply dumps, searching out small detachments of guerrillas, and in general attempting to keep the Vietminh forces off balance so that they could not mass for large-scale attacks. These tactics were moderately successful when the Communist forces were weak and poorly equipped, but they backfired disastrously in the recent battle at Dien Bien Phu.

French strategy has largely been dictated by the peculiar nature of the war. The French have been plagued by two large, related factors: (1) the war has been against guerrilla forces that have had all the advantages of terrain and jungle, that have cleverly avoided pitched battles, and that have outmaneuvered and infiltrated French positions to such an extent that no area could be considered to be definitely cleared of them; (2) the French have fought without the full support of the native population—indeed in many areas of Vietnam the population has actively supported the Vietminh. The result has been that a tremendous part of the manpower of the free forces has been pinned down in the endless repetition of clearing and reclearing the most essential areas. In the interior, French operations have largely taken the form of defensive sorties from their established strong points. These tactics have wisely avoided setting up permanent defense lines and have denied the guerrillas clear-cut victory and prevented them from consolidating their positions in certain areas in order to launch large attacks. But the French have not been able to prevent constant infiltration nor have they ever been able to launch a large sustained offensive of their own.

French air forces have attacked Vietminh troops engaged in raids against outposts. They have bombed highways and supply dumps. But the highways have been repaired quickly, and most of the supply dumps have been too small to cause serious loss to the Communists. Although the French have made systematic use of aerial reconnaissance, the effectiveness of this form of intelligence has been slight because of the nature of the terrain. Their agent intelligence system has achieved little better results. Poor intelligence and difficult terrain have combined to reduce greatly the effects of the air action.

Summary

THIS brief run-down of the military situation should serve to reinforce the statement made early in the article that a military decision in Indo-China of a nature that promised a stable and purposeful peace could only come after a political solution had been found to the intertwined problems of Indo-China. French-Vietnam forces have been put on the defensive and have been slowly losing the war even though they outnumbered the Communists almost two to one on the ground and had complete freedom of the air and of the sea. This emphasizes the difficulty and the wrenching cost in lives and money involved in a ground war fought in the midst of an unsympathetic population. A way must be found to grant the Indochinese complete independence, to construct a national anti-Communist government that will rally all the divergent elements and strengthen the mutual ties of the three Associated States, to counter actively and at the village level the Communist political propaganda with a concrete program for the betterment of the lot of the Indochinese people. Americans must realize that not only French prestige is involved in Indo-China but that of the U.S. as well. All Asia knows that the United States is bearing some 78 per cent of the total cost of the war on the side of the free forces. This should not continue to seem merely support of French colonialism, nor should the U.S. make the mistake of pouring divisions of white infantry into this country where white man is synonymous with Frenchman.

The description of the terrain and the climate suggests other reasons why another Korean-type, land-based strategy would be the most costly and undesirable way of resolving the military situation in Indo-China. The Communists could scarcely choose a better battleground on which to chew American ground strength to pieces and to drain away American economic strength. For every ten infantry divisions needed in Korea, twenty might be needed here. What could tempt the Chinese Communist forces more to throw in large numbers of their own troops and through terrible attrition to whittle away the American will to resist Communist aggression here or anywhere else in the world?

The French experience with the employment of air forces in the terrain and against the guerrilla tactics of the Indo-China war has also indicated the difficulty which confronts an enlarged air campaign confined to Indo-China and to conventional weapons.

Indo-China: Situation Map

June 1954



The Great Lesson

THE great lesson of Korea was that stalemate and uneasy truce can be expected when a nation is unwilling to commit sufficient forces to produce a decision. In Korea, sickened by the mounting casualties from the ground war, the U.S. halted ground pressure and turned to air pressure. But it was an air pressure hampered by a predominantly ground strategy and denied the opportunity for decisive action by the decision to restrict the air campaign to Korea.

Under these limitations the air campaign became largely a prolonged interdiction campaign whose attritive action was finally sufficient to bring the Communists to terms but which was not decisive enough to force the enemy to agree to the unification of Korea.

Much the same can be said for the Indo-China war. Even in the unfavorable circumstances air power may produce a decision. If air forces are limited to operations within Indo-China, they may eventually harry and attrite the Communists into terms. But the nature of the terrain and the character of the war will require exceedingly high force levels to achieve this limited result.

What alternatives are there to such a course? One is to let Indo-China go by default. With it would soon go the rest of Southeast Asia—eventually, perhaps most of Asia. Another is to undertake the action primarily by ground forces, at the cost which has been previously indicated. A third is that air forces could direct limited action against the source of aggression.

In the soothing light of retrospect many students of the Korean War have concluded that the danger of all-out war that had seemed so critical if U.S. air forces were loosed on Manchuria was in fact not merely so great as it seemed in 1950 and 1951. Had clear-cut, positive, just terms been offered in advance, had it been made clear that if the terms were not accepted the USAF would advance its bomb line to include military targets in Manchuria, many now think it less than likely that Communist China would have risked her precious industrial pittance or that the U.S.S.R. would have chosen to remember her mutual defense treaty with China.

If this reasoning holds for Korea, it would be much more valid for the Indo-China war. Far removed from the borders of the U.S.S.R. and from Communist industry, South China would offer a much more accessible target system than do the mountains and jungles of Indo-China. In the reaches of South China the skeletal transportation system on which the Vietminh depends for its war materiel could be quickly and easily neutralized. If the present storage dumps were destroyed for a distance of several hundred miles north of the border and the transportation system was knocked out and kept out, the Vietminh forces would soon begin to feel the pinch. A coastal blockade could prevent supply from reaching them by sea and Vietnam troops could be used to move in and mop-up weakened Vietminh resistance. Once armed reconnaissance had been established over Yunnan and Kwangsi provinces, the Nationalist Chinese guerrillas in the hills could be supplied and armed to prevent the Communists from using large-scale A-frame transportation of supplies to Indo-China. They could also blow bridges, ambush truck convoys, and in general keep the Communists occupied and off balance.

The risk *seems* high; the stakes *are* high.

In My Opinion . . .

THE PRINCIPLES OF WAR WILL GET YOU IF YOU DON'T WATCH OUT

COLONEL RICHARD C. WELLER

GENERALLY speaking, military men revere the principles of war, and some even stand in awe of them. However, the reduction of some very wise precautions which ought to be observed in battle, to extreme skeletal form, is as likely to mislead the military man as it is likely to keep him out of trouble.

To persuade oneself that this can be true, it is only necessary to examine the words of a general officer of the U.S. Army speaking before the public in 1952 relative to the influence of military factors on foreign policy:

It is my opinion that the role of the Army in the foreseeable future will be basically the same role it has played since man started fighting wars—to drive the enemy from the ground he occupies in order to gain a position from which to control his activities.

In its final sense the war between nations is reduced to the simple fact of a man defending his land while another tries to invade it.

I do not believe that warfare in the future will call for any compromise on the principles of war, for by their very nature they are immutable. I refer particularly to the principle that the objective of all military operations is the destruction of the enemy's armed forces and his will to fight.

What the General has said here is that the ultimate determinant of military victory is the trained rifleman with his feet on the ground.

No one can object to the General bearing an opinion about the role of the Army in the foreseeable future; nor can any one object to his over-simplification of war as a matter of a man defending his land while another tries to take it away from him. But when the General calls upon a principle of war to demonstrate the truth of his opinion, he is falling victim to the skeletal form in which they are stated.

The principles of war, and this includes the principle of the objective, refer to no particular branch of the military service or to any particular force—task or otherwise.

The principle of the objective merely states that the purpose of military operation is the attainment of the objective assigned a designated force. When further amplified, this principle of war goes on to recognize that these objectives may vary widely but in general the principle of the objective will include first the neutralization or destruction of the opposing military power.

It is immediately obvious that whatever truth there may be in the General's convictions, the principles of war offer little support for his strategic deductions. And anyone who is persuaded that war must be won on the ground by infantry divisions because the principle of the objective states that a designated military force must have an objective, can readily see how foreign policy may be misled by its military contribution. The trouble is not that the principles of war are immutable but that anyone who seeks confirmation on a level lower than the level of generalization in which they are stated, runs the very grave risk of misinterpretation, the result of which can only be faulty military strategy.

As with the military profession, the farmer also has reduced his farming operations to a series of principles. There are the principles involved in ploughing, planting, cultivation, and harvest, though he has generally neglected to theorize his occupation to the extent of elevating the motives of these operations to the status of principles. But the farmer, unlike the military man, has cast off the horse and blade for ploughing, the scattering of seed by hand, cultivating with a fork and spade, and harvesting with a blanket and stout stick.

The significance of the principles of war, like that of the principles of farming, is that the basic operations still remain. One still ploughs, but with a tractor; cultivates, but with a cultivator; and harvests, but with a mechanical harvester.

Only in a small degree has the military man permitted himself to cast off methods which by his own admission can and do change with new inventions. The General confirms this further by saying: "In essence, the army's mission in war will continue to aim at the destruction of enemy land forces in order to lay bare the vital areas of his homeland." If the General could or would establish that the enemy's homeland cannot be laid bare except by destruction of his land forces in some other way than by calling upon the principles of war for support, his strategic evaluation of an army might be correct. But it is quite obvious that if the enemy's vital areas are the objective of a designated force, then few designated forces could be as effective as atomic bombs and long-range bombers.

What too many military men fail to understand is that the principles of war are not the exclusive property of the armies or navies but that the real final determinant of military victory is that element of war which dominates all others.

Oddly enough, military men agree that air power or the air element is dominant over the surface elements. But this has only stimulated them to seize for their own element all of the air support which eloquence permits. In the meantime the real lessons that the principles of war might teach us go unheeded.

Everything depends upon air supremacy: everything else must take second place. With control of the air, control of the sea and land follows. Whether additional objectives must be given to additional designated forces is a measure of political and economic skill. It is the enemy, his geography, and our own objectives which determine these things, and the principles of war will get you if you don't watch out.

Air War College

This Word *Strategy*

BRIGADIER GENERAL ALFRED R. MAXWELL

THE importance of strategy is being emphasized in a painful manner. For nearly a decade the world has witnessed the political paradox of a backward Eurasia, with many obvious weaknesses, dominating the policy of the rest of the world. The resulting frustration and the feeling of being pushed around have been particularly galling for Americans. In spite of our accomplishments vis-à-vis the Communist threat, Western confidence is still diluted with fear and respect for the Communists' grim list of successes. What is the factor which helps the apparently weak hold the initiative over the supposedly strong? Is it an inherent geopolitical endowment, or is it some ingredient in the Kremlin's game which inspires such foreboding?

We don't fear Soviet weapons nor do we fear the hordes of Red fighting men. I don't think we really fear the Communist ideology or even the ruthlessness of the Communist conspiracy, but rather the tenacious, insidious intellectual force behind the conspiracy. This force, which affects the policies of all governments, comes from a brain or a few brains in the Kremlin. We know this now, for we felt this force subside and falter after the old dictator died and the new dictator paused to consolidate his position. Evidently this intellectual force is generated by strategy. Our survival may depend in substantial measure on our ability to grasp and practice this art. For strategy turns potential into dynamic power, unifying and multiplying force which might otherwise be diffused and dissipated. This is one enemy "weapon" that we should be using and improving; it is not inherently evil, although used by the Communists for evil ends.

If strategy can be so decisive, it is vital that leaders at all levels understand and use this instrument. Why isn't strategy recognized as a great art, deliberately taught (as are other arts) and developed for wider use? Knowledge of such an art should bring confidence, in itself an important asset. While the subject can be found in service-school curricula, it is generally taught as routine planning, a mechanical or methodical function, rather than as a rare and powerful art. Much of the subject matter is properly

logistics. But the pedestrian approach and the semantic confusion have produced in many officers a disturbing inability to discuss strategy. Can we afford to continue our haphazard approach to the art of survival? In a time of peril reliance on genius, intuition, and self-acquired knowledge is not adequate. Our failure or our inability to emphasize and teach this art is most likely directly related to its abstract, subjective nature. We cannot see it clearly enough to judge its potency as an element of success. Also the scope and complexity of modern planning tend to dull the edge of thought or to substitute massive staff work for the art of command.

Too many of us think strategy is something reserved for top Pentagon staffs only. Yet according to current usage, strategy is not exclusively military, nor is it useful only for war. It may have always had a civilian connotation, for it was derived in a day when leaders combined military and civil power. Today civilian life has many practitioners of the art. Strategy is a major tool of statesmen, politicians, courtroom lawyers, businessmen, and salesmen; lovers use it and so do doctors; it is basic to poker and many types of athletic contests; it is widespread in popular fiction and featured by comic strips, radio, and TV (perhaps this is not unrelated to rumors that some of our greatest strategists have yet to pass their tenth birthday).

So the wide divergence between specialized military usage and popular usage seems unsound in this day of heightened civilian involvement in military problems and national policy. But this is not the only semantic difficulty. With the word now common in everyday usage, *strategy* has probably never had greater variety of meaning. Even on well-informed levels, the word is used variously as a synonym for plan, concept (of plan), policy, decision, choice, technique, tactics, logistics, or leadership ability. It varies

The word *strategy* has occupied much the same relation to warfare that "theology" has to religion or "electronics" to radio. People know little about it, vaguely recognize it is necessary, but consider it a highly technical, abstruse form of mental gymnastics comprehensible only to a rather special type of individual who has had years of intensive experience. Brigadier General Alfred R. Maxwell, Senior Air Force Staff Officer to the Assistant Secretary of Defense, Research and Development, does not agree with this idea. In his correspondence with the Editors, General Maxwell commented: "The next war will not be won by technology alone—it will be won by the best combination of brains and technology—in a word, strategy. It is time we took the subject out of the rare book section and put it into everyday text books." In an attempt to bring the term *strategy* to more definite understanding, General Maxwell has collected and commented on the various conceptions of its meaning. Out of this review he formulates a modern definition.

from a simple thought to one embracing the whole art of war or national management.

The word *strategy*, having so many meanings to different people, has lost its significance. The worst of this semantic retrogression is that we may have lost sight of its importance to all types of leadership and of its potency as a winning factor.

Strategy, the art, should be re-discovered and harnessed for victory. But first must come understanding of its nature and belief in its rewards. A definition is basic. An acceptable common definition would broaden its usefulness. So let us research, illuminate, and try to understand this elusive ingredient of command, power, and success.

Strategy - A Commentary on the Art of Definition

*The exact meaning of the word "strategy" is as generally misunderstood as is the study of the art it describes is generally neglected. Yet such confusion is not due to the want of definition. Almost every military writer of repute has tried his hand at it and the only embarrassment is to choose the best.*¹

The Dictionary Approach

Derivation of Strategy—From the Greek: *Strategos*, denoting a leader of an army or a chief magistrate, or the office of the same; and other derivations such as *strategia*, meaning campaign and stratagem. It is interesting to note that all these meanings are ingredients of contemporary definitions.

Definitions—*The science of combining and employing the means which the different branches of the art of war afford, for the purpose of forming projects of operations and of directing great military movements. The art of moving troops so as to be enabled either to dispense with battle or to deliver one with the greatest advantage and with the most decisive results; generalship . . .*²

A rare but interesting usage as a verb: *To force (a person) into (a position) by strategy.*³

The most respected American authority: *The science and art of employing*

¹Col. G. F. R. Henderson, *The Science of War* (London-New York: Longman's-Green & Co.), 1906.

²*Century Dictionary*, 1911 edition.

³*Oxford English Dictionary*, 1919 edition.

*the armed strength of a belligerent to secure the objectives of war. More restricted, the science and art of military command, exercised to meet the enemy in combat under advantageous conditions. Also a kind of instance of it. Use of stratagem or artifice; planning; intrigue. Verb: to maneuver.*⁴

A recent military definition: *The science and technique of planning on a large scale for the most advantageous employment of military forces and materiel.*⁵

All these definitions are oriented toward the employment or threat of military force. It can be questioned that strategy, even military strategy, is exclusively the realm of generals, or that generalship is limited to strategy. Here is an excellent civilian definition: *The display or exercise of skill and forethought in carrying out one's plans, schemes, etc.; the use of stratagem or artifice, as in business, politics, or society, or in games.*⁶

The Strategy-vis à vis-Tactics Approach

Some of these were extreme, and a few, ludicrous. To illustrate some typical ones: (a) *strategy is all that is left when all that pertains to tactics is eliminated from the whole science of leadership;* (b) *strategy is large-scale operations—tactics, minor ones;* (c) *strategy is the concern solely of high ranking officers—tactics, of low ranks;* (d) *strategy covers employment before contact with the enemy—tactics covers battle actions after contact;* (e) *strategy uses the fight as a means to a greater end—tactics is concerned with success on the spot for its own sake;* (f) *strategy concerns itself with the theater of war—tactics with the battle;* (g) *strategy is the employment of armies while tactics is the handling and disposition of troops in battle.*⁷ Definition (d) is a recent interpretation of the U.S. Army; (e) and (f) are pertinent in clarifying the roles of USAF strategical and tactical aviation. But the general confusion in these definitions is compounded when one realizes that "tactics" itself has several meanings.

The Historical Approach

The word strategy does not appear until about two hundred years ago, but acts of strategy are much older as witnessed by the Greek derivation of the modern word. The earliest known military treatise, written by the Chinese general Sun Tzu in 500 B.C., has been translated with startling clarity by using the modern words in appropriate context. Sun Tzu said: *Thus it is that in war the victorious strategist seeks battle after his plans indicate that victory is possible under them, whereas he who is destined to defeat first fights without skillful planning and expects victory to come without planning.*⁸ A modern Oriental parallel is seen in another thought of Sun Tzu: *All men can see these tactics whereby I conquer but what none can see is the strategy out of which victory is evolved.*

⁴Webster's New International Dictionary, 1945 edition.

⁵New Military and Naval Dictionary (New York: Philosophical Library), 1951. See also several but separate definitions of strategy, national strategy, and military strategy in *Dictionary of U.S. Military Terms for Joint Usage* (Second Revision), Departments of the Army, the Navy, and the Air Force, April, 1953; all approved by the Joint Chiefs of Staff, these might have been called "grand strategy" in earlier times.

⁶Funk and Wagnalls New Standard Dictionary, 1949.

⁷Definition of Strategy, a limited issue compiled by Army-Navy Staff College, 1945; to be found in U.S. National War College Library.

⁸Sun Tzu. *The Art of War* (Harrisburg, Pa.: Military Services Publishing Co.), 1944.

Prior to the eighteenth century *tactics*, *grand tactics*, and *art of war* were used to express the art pursued by the general officer. Neither Napoleon nor Frederick the Great, those masters of strategy, are believed to have used the word, although they spoke of "conceptions," "calculations," "projects," "ruses," "plans," and the "art of war."

Later Von Moltke left a short and apparently straightforward definition: *Strategy is the application of common sense to war.*⁹ This has a peculiarly modern ring to it but depends on a definition of common sense. Clausewitz had a similar one: *Strategy is not a science of lines and angles but is common sense.*¹⁰

As the Industrial Age and mass levies made war and preparation for war much more complex, the former division into strategy and tactics became strained. French and Italian writers groped toward a new concept. First came an enlargement of the old definitions to take in the increase in planning. One such attempt was that of General Bonnal of the French Army War College: *Strategy is the science of conceiving; tactics is the science of executing.*¹¹ The intellectual aspect of strategy was also stressed in a more poetical definition by Baron de Jomini: *Strategy is the art of making war upon the map, and comprehends the whole theater of operations. It precedes the operations of the campaign, the clash of arms on the field. It is done in the cabinet, it is the work of the student, with his dividers in his hand and his information lying beside him.*¹² It was also Jomini who felt that strategy was conception; execution was divided into logistics, that which is before contact, and tactics, that which is after contact: *Logistics comprises the means and arrangements which work out the plans of strategy and tactics. Strategy decides where to act; logistics is the act of moving armies; it brings the troops to the point of action and controls questions of supply; grand tactics decides the method of giving battle.*¹³ This architectural view was stated more precisely by Clausewitz: *Strategy is the art of employment of battles as a means to gain the object of the war. In other words, strategy forms the plan of war, maps out the proposed course of the different campaigns which compose the war, and regulates the battles to be fought in each.*¹⁴

A contemporary American officer has put it more concisely: *Strategy is the design of war. A poorly designed structure is certain to fail in the end.*¹⁵

The Modern Approach

Many of the modern definitions of strategy have reflected a steadily widening concept. General MacArthur, who has a world-wide reputation as an articulate strategist, offered me this concept in 1950 under impromptu circumstances: There are two great branches of the art of war—strategy and tactics. Tactics is proper handling and disposition of weapons and troops. This branch of the art is always changing. Strategy concerns itself with things immutable, with basic policies, such as: to achieve victory we must

⁹*Definitions of Strategy.*

¹⁰Maj. Gen. T. B. Pilcher, *War According to Clausewitz* (London: Cassell & Co., Ltd.), 1918.

¹¹Admiral R. V. P. Castex, *Theories Strategiques*, translation, U.S. Naval War College, 1939.

¹²Baron Antoine Henri de Jomini, *The Art of War*, translated by Capt. G. H. Mendell and W. P. Craighill (Philadelphia: J. B. Lippincott & Co.), 1879.

¹³*Ibid.*

¹⁴Karl von Clausewitz, *On War*, translated by O. J. Mattijs Jolles (New York: Random House), 1943. One of the many similar definitions in his works. See also *Principles of War*, translated by Hans W. Gotzke (Harrisburg, Pa.: Military Services Publishing Co.), 1942.

¹⁵Col. B. Q. Jones, *War Doctrines*, a compilation, U.S. Army Engineers, VI-AC-1942.

have superior force at the proper place and time; must utilize concentration at essential points; must keep troops supplied.

The greatest enlargement of strategy has come from outside the military. Strategy has stepped beyond the bounds of the art of war. Von Neumann's theoretical work described the strategical situation in games as the interaction between two or more persons, each of whose actions is based on an expectation concerning the actions of others over whom he has no control. The outcome depends upon the personal moves of the participants.¹⁶ Basing his book on Von Neumann's work, John McDonald said, *The policy followed in making these moves is strategy*. He also called it optimum policy, i.e., a plan to optimize results. The word "optimize" was carefully chosen rather than the more fallacious use of "maximize." Thus *Strategy is a policy devised to reduce and control these uncertainties*.¹⁷ Another modern expansion of strategy comes from Edward Earle, whose book and lectures have made him familiar to us: *Strategy, therefore, is not merely a concept of war-time, but is an inherent element of statecraft at all times. Only the most restricted terminology would now define strategy as the art of military command*.¹⁸

¹⁶John von Neumann and Oskar Morgenstern, *Theory of Games and Economic Behavior* (Princeton, N. J.: Princeton University Press), 1947.

¹⁷John McDonald, *Strategy in Poker, Business and War* (New York: W. W. Norton and Co.), 1950. Expanded from two articles in *Fortune Magazine*, March 1948 and June 1949. Excellent contributions written in lay language, although I do not wholly accept his usage.

¹⁸Edward Meade Earle, *Makers of Modern Strategy* (Princeton, N. J.: Princeton University Press), 1943.

What Should Strategy Mean?

THERE is nothing immutable about words; if the thing named changes, the meaning of the name should also. The scope of (grand) strategy has changed greatly, but has its fundamental significance? In the past the word *strategy* has had a limited professional significance, and perhaps it should have now. It is notable that much of popular usage, unlike current military usage, seems to embody this meaning of the word. The most useful course might be to adopt the best in each usage and work toward a common definition. We should, in our own usage, strive for refinements and shades of meaning appropriate to the level and scope of operation without departing from the basic meaning.

There is general agreement that strategy is peculiar to conflict or competitive situations, "hot" or "cold;" that it is founded on scientific principles; and that it is an art. Then let us evaluate the typical definitions and reject all the dull and sterile. By this

exercise it will be found that a historical integrity of meaning becomes more apparent. The fundamental meaning begins to come into focus. One is struck by the prevalence of intellectual connotations, as demonstrated by the following random selection from the more intelligent and inspired discussions on the subject:

Strategy thinks out a situation beforehand; "the *conception* of the general plan;" "conquered by *skill*;" "far-sighted;" "the science of *conception*;" "to *devise*;" "the *purpose* of battle;" "the *determination* of the objective;" "*intellectual*, as differing from the methodical in war;" "the *direction* or management of war;" "the effective way."¹⁹

An English author has stated "Peace strategy may be defined as the *mental habit* of the king who sat down to consider whether, with ten thousand men, he could meet his enemy who was coming against him with twenty thousand."²⁰ A singular provocative illustration reminding us that cleverness is not often too apparent in the actions of the stronger side, this thought possibly sheds light on why strategy in our military vocabulary today is often more synonymous with mass logistics than to skillful conception.

Reflection on this distilled intellectual connotation—the sphere of strategy is a *psychological* arena (skillful mental analysis, wise planning, shrewd direction, wile, outwitting the opponent or enemy, etc.)—reveals natural divisions between strategy, logistics, and tactics and a broadened common usage or strategy. Now strategy becomes a mental tool and a goal for men at all levels and in any scope of conflict: the general and the statesman, the quarterback and the corporal of a squad, and even the individual. It is now a recognizable attribute of certain successful civilians and military men alike. It can and should aid statesmen to play a vital part in avoiding war.

We can now accept current usage to the extent that strategy is sometimes synonymous with planning, or is an ingredient in planning in those competitive situations where chance, human behavior, and ignorance (the "fog of war") have large dynamic roles and where mental skill can increase chance of victory and reduce chance of defeat, or improve the results of either victory or defeat.

In the simplest competitive situations strategy and plans exist only in the minds of individuals and therefore are generally distinguishable only in retrospect. The plan is often undisclosed or the intent disguised. Strategy may consist only of the applica-

¹⁹*Definitions of Strategy*. Italics added.

²⁰"The Foundations of Reform," military correspondent of the *Times*, (London) 1908. Italics added. Undoubtedly the author had in mind a passage in the Bible, Luke 14:31.

tion of surprise, wile, or a stratagem. Hence we may refer to the central concept or design as *the strategy*.

In complex situations and in large organizations there is a need for written plans for purposes of communicating, regulating, organizing, and recording a program of action with many interdependent parts. This requires large specialized planning teams and greater use of scientific techniques. The art and the science are two different qualities, for science deals with known laws and measurable factors. Here the difference between strategy and routine planning is similar to the difference between art and drafting. The artist/architect sketches an unusual design (concept) by his skill in designing, adapting, and combining the available materials and techniques. His draftsmen work up the detailed plans (drawings) needed by the contractor.

The plan itself is an analytical reconciliation of the objectives with the means and all known factors. It contains the overt decisions and establishes the basis for organization, logistics, and tactics. It may contain the basis for strategy or outline the strategy itself. When motivated by strategy, the pattern of execution should not disclose the strategy (design) prematurely. Strategy (application) does not end when the plan goes into execution. It must supervise organization and tactics and be responsive to changing circumstances. This is important. Strategy is as dynamic as struggle. It must periodically reassess and change as warranted. On the other hand a plan is more likely to be a fixed course of action.

Even competitive plans may lack strategy, if they are adequate without it or because incentive, inspiration, or skill are missing. Strategy thrives best when goals, objectives, and policies are clear and compelling. Especially it thrives under adversity.

Is (the) strategy something that is only recognized in the action and judged by the results? Perhaps this was what Von Moltke and Clausewitz meant by "common sense;" after the fact the strategy may be recognized as beautiful, simple, and obviously common sense. After its initial success, if copied or repeated often enough, it becomes somewhat less than a piece of original art, perhaps a technique, or a tactic, or a common sense (as normally defined) practice. The original design may still be intrinsically good, but now art or strategy consists of the skill of knowing when and how to use it or adapt it.

Strategy strives to gain and keep the initiative or outwit the opponent (be it individual or nation), to control his thinking and thereby his moves, thus placing him at a greater relative dis-

advantage. As in any art, it must therefore be the work of an individual or at most a small, inspired team. Strategy may be considered as an intense personal struggle in which the leader or manager at each level of competition strives subjectively to measure, understand, and master his opponent, leaving objective matters (capabilities, logistics, etc.) to his staff. Naturally the plan and its execution bears the stamp of these individual leaders. Field Marshal Montgomery used to speak of Rommel and Rommel's "intentions" as if he were preparing for a duel with Rommel himself.

The initiative must not be confused with the offensive, for strategy is no less needed in defensive situations. Great skill is often needed to know when to change from the defensive to the offensive, and vice versa. Nor is strategy only concerned with victory or its fruits. Strategy is vital to the loser to reduce his losses and the after-effects of losing. There are even situations where losing is the best strategy in the long run.

It appears that the elements or tools of strategy are: (1) a sound plan, with proper objectives, founded on judgment, experience, intelligence, and psychological evaluation; (2) as appropriate, timing, secrecy, surprise, ruse, feint, maneuver, cover plan, and propaganda; (3) forces, resources, logistics, and tactics; (4) above all, guidance by scientific principles. Among these principles are the Principles of War, proven by the military but just as valuable to civilian strategists. Strategy is the intellectual art of selecting, disregarding, combining, and adapting the information, tools, resources, and principles to the situation; it is distinguished from planning by the degree of its art.

Therefore *strategy is the art of infusing into a plan and/or applying a central idea, design, or timing which will give the greatest possible advantage in a campaign or situation. The strategy is the specific design used.*

Headquarters, USAF

Enemy Antiaircraft Defenses In North Korea

MAJOR ANDREW T. SOLTYS

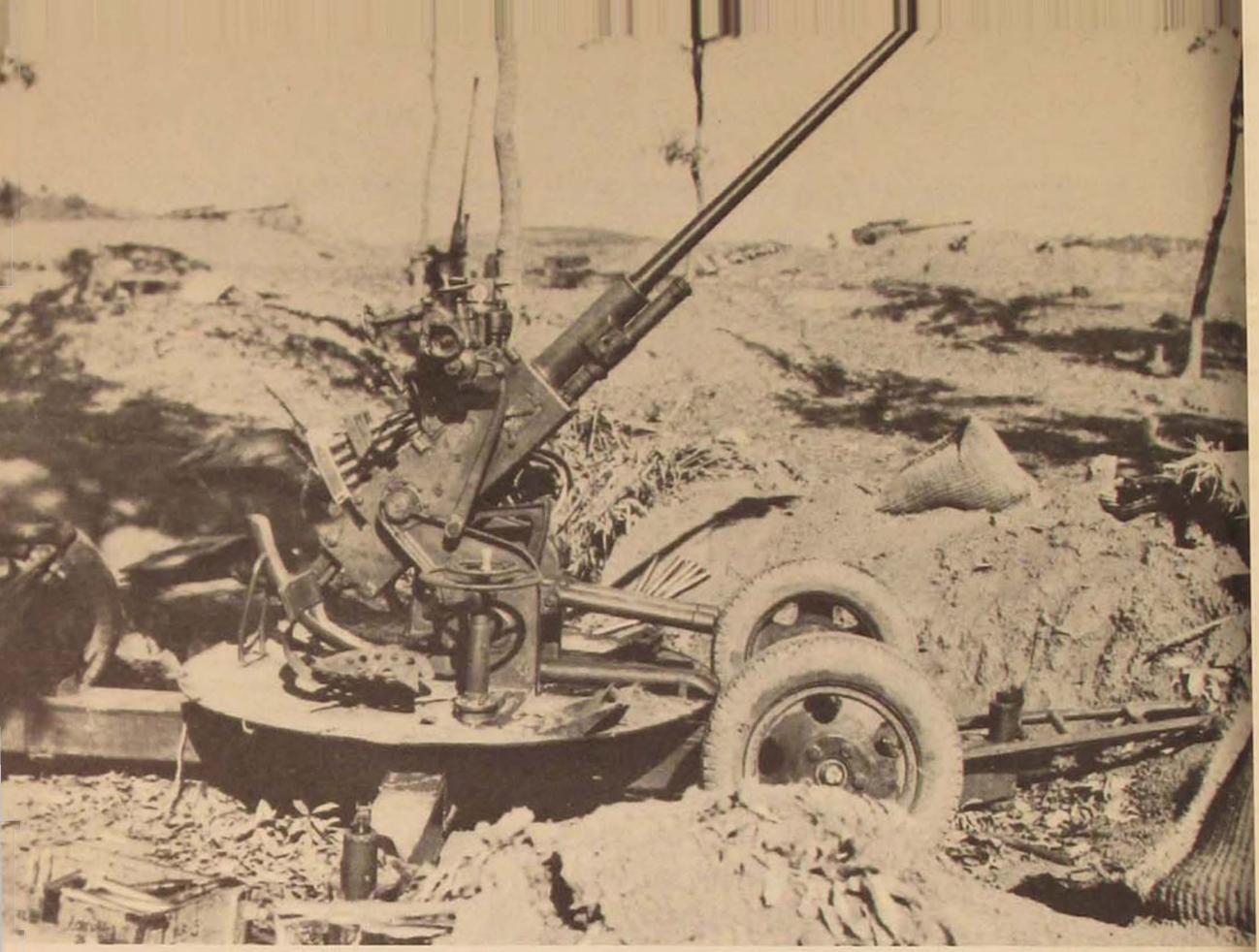
THROUGHOUT the Korean War the Communists used out-of-date World War II antiaircraft equipment and followed World War II methods of antiaircraft defenses. Effectiveness of enemy antiaircraft fire was limited, especially in the case of their heavy guns. Best results were attained by automatic weapons and small arms. Despite the large build-ups of antiaircraft weapons, enemy flak was never effective enough to turn UNC aircraft away from target areas. In fact attrition of friendly aircraft was reduced considerably as the war progressed. Flak positions were pinpointed from photography and crew reports, and UNC air forces nullified much of the enemy's flak effort through flak analysis, pre-briefing of missions, flak suppression from the air, flak suppression by field artillery in the forward areas, and the restriction on minimum bombing altitude.

Early Defenses

In the early months of the war very few antiaircraft weapons were deployed in North Korea. These few were intended for defense against the small ROK Air Force. North Korean ground forces were equipped with eighteen 12.7-mm Soviet guns per infantry division. The only significant grouping of antiaircraft weapons in the rear was at Pyongyang. Of the twenty 76-mm Soviet antiaircraft artillery guns in that vicinity, three were controlled by a radar of the British G.L. Mark II type—early World War II radar. For fire-control the batteries used the Puazo 3 director and the DYA 4-meter base range finder. Later 37-mm antiaircraft automatic weapons (AW) and 85-mm Soviet antiaircraft guns were reported to have been added to Pyongyang's defenses.

When UNC air forces entered the Korean War, the enemy faced the problem of how best to employ his limited stock of antiaircraft weapons to gain some protection from air attack. After the Chinese Communist intervention

The plight of a modern land army without protective air cover was underscored in many ways during the Korean War. Subjected for over two years to U.N. round-the-clock assault from the air, the enemy was reduced from a well-supplied, offensive-minded army to battered defensive forces committed to sustaining a position in static warfare. Without committing air forces of his own to counter the U.N. air forces, the enemy relied on a myriad of traditional ground defense measures, none of which was able to protect him. Because of the unusual amount of low-level interdiction and close-support attacks upon him, fighters-bombers and light bombers constantly skimmed the tree tops, within easy range even of small-arms fire. Yet in reviewing the Communist attempts to defend critical targets with antiaircraft weapons, Major Andrew T. Soltys, U.S. Army, Antiaircraft Intelligence Officer, Deputy for Intelligence, Headquarters FEAF, restates a significant lesson—that antiaircraft artillery defenses cannot repel determined air attack.



A captured Communist anti-aircraft defense site in North Korea shows the various types of weapons employed in a typical battery. In the foreground is the Soviet 37-mm M-1939, the enemy's principal anti-aircraft automatic weapon. Directly behind the 37-mm, its barrel vertical between two trees, is a Soviet 40-mm automatic weapon. These two pieces were used for local defense against aircraft making strafing and flak-suppression attacks on an adjacent heavy battery. The two guns horizontal against the background skyline are Soviet 85-mm guns in the heavy battery

large quantities of anti-aircraft weapons and crews were available for the establishment of numerous defenses. With the influx of Soviet-made guns, radar, automatic weapons, machine guns, and searchlights and the improvement in the early warning system through the employment of Early Warning and Ground Control Intercept radar, the number of defended areas was expanded until there were 80 or so. Defenses ranged from a few AW and machine guns in the combat areas to large, coordinated networks incorporating guns, radar, automatic weapons, machine guns, and searchlights.

The Far East Air Forces interdiction program gave the Communists little choice in the selection of defense sites. Of necessity the air defenses were concentrated along the main rail and supply lines. As additional equipment arrived, defenses were also provided for major industrial or storage centers, in the forward areas, and at scattered miscellaneous areas. The four major centers consistently well defended were the North Korean capital of Pyongyang and the sensitive targets of Sinuiju, Suiho Dam, and Manpojin along the Yalu River. The west coast rail and supply routes received the next

largest amounts of equipment, followed by the miscellaneous areas, and lastly by the front-line areas.

Communist Antiaircraft Defenses: September 1952 - July 1953

	<i>guns</i>	<i>automatic weapons</i>
Rail lines and MSR's	31%	46%
Major centers*	59%	18%
Forward areas	2%**	17%
Miscellaneous	8%	19%

*Pyongyang, Sinulju, Suiho Dam, Manpojin.

**During the last five weeks of hostilities 8.3 per cent of the total number of guns were employed in forward areas. During the previous ten weeks this figure averaged 1.3 per cent.

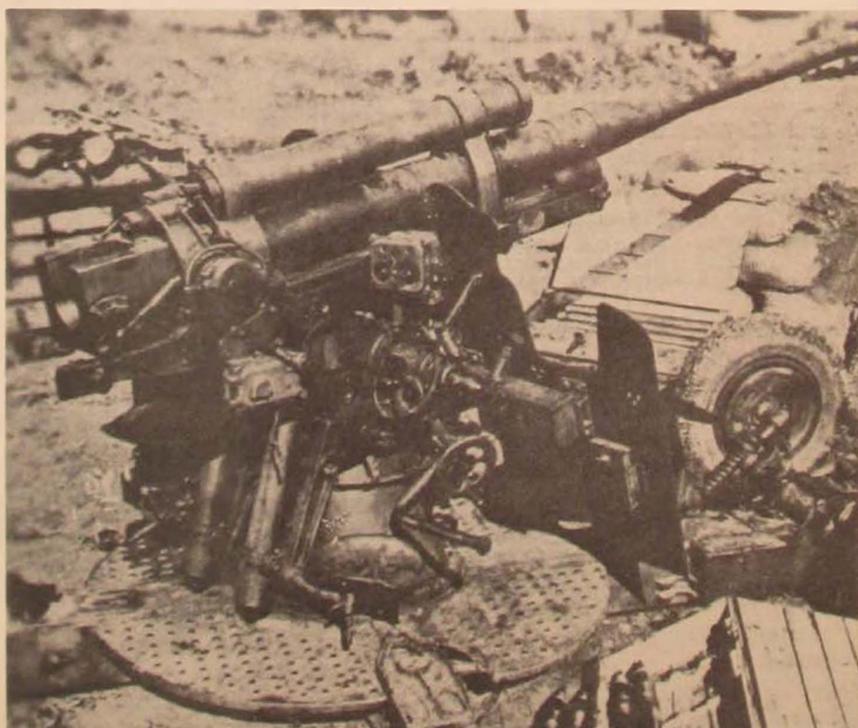
Later Developments

AIRFIELDS were defended until UNC aircraft forcefully demonstrated the futility of such defenses—even at Namsi and Taechon where excellent gun and automatic weapon defenses included gun-laying radar (GLR). The defenses at most airfields were completely removed in mid-1952. Thereafter the only air fields receiving constant antiaircraft protection were those within the major centers of Pyongyang and Sinuiju. From time to time, as a direct reaction to UNC air operations, the enemy rushed temporary antiaircraft defenses to critical objectives such as bridge complexes, power plants, dams, and troop or supply concentrations in forward areas. Antiaircraft weapons were also diverted to anti-invasion defenses in the spring and fall seasons.

The total amounts of enemy antiaircraft equipment rose considerably during the war:

	<i>July 1950</i>	<i>July 1951</i>	<i>July 1952</i>	<i>July 1953</i>
Guns	36	278	317	720
Automatic weapons	100	794	1304	922

The Soviet 85-mm M-1939 antiaircraft artillery gun was the most widely used heavy weapon employed by the Communists against U.N. air attack in Korea. Guns numbered from two to eight per battery, and in the early days were operated without gun-laying radar. Even though the enemy later used GLR extensively, U.N. losses to antiaircraft fire dropped through use of a minimum bombing altitude and improvement in flak intelligence and flak briefing.



This table does not reflect peak figures for each type of equipment. Guns reached a record high of 807 at the end of January 1953. Accompanying this increase in guns was a gain in GLR units and in the number of eight-gun batteries. By March 1953 thirty-two sets of gun-laying radar controlled 222 guns. Eight-gun batteries in October 1952 totaled eleven, of which eight were radar controlled. This figure climbed to a high of 37 batteries in January 1953, half of them radar controlled. Automatic weapons reached a record high of 1672 in January 1952; as the number of guns increased the AW total fluctuated considerably. During the last six months of combat, automatic weapons generally totalled less than 1000 pieces. The amounts of antiaircraft weapons and the number of defended areas may give the impression that antiaircraft defenses in North Korea were strong. But in comparison with World War II standards the enemy flak defenses were weak and equipment was second-rate. These factors, plus FEAF's intensive program of locating flak concentrations and briefing pilots on flak evasion, accounted for relatively light losses.

The most important type of antiaircraft artillery gun used in Korea was probably the highly mobile 85-mm Soviet, M-1939. These guns were normally employed four or eight to a battery, although two, three, five, and six guns in a battery were not uncommon. Gun-laying radar is usually considered essential to a modern antiaircraft battery, but the enemy had none during the early stages of the war. Gun-laying radar determines range to the target. With other data obtained by visually tracking the target with the director, range is essential in predicting firing data for the guns. Also GLR can provide all present-position data to the director when poor visibility precludes visual tracking with the director. Most of the enemy gun batteries depended upon a director and height-finder to obtain present-position data. Under this system searchlights had to be used at night to illuminate targets for visual tracking. Gun-laying radars were assigned to high-priority defenses along the west coast and in the northwest sector, but even so there were not as many GLRs as there were batteries. Many antiaircraft searchlights, some of them radar-controlled, had to be used during night engagements. Most of the searchlights were in the northwest sector along the Yalu River and at Pyongyang. Searchlights were also used in these areas to spot UNC aircraft for enemy interceptors. On several occasions during night attacks over major objectives flare illumination and enemy aircraft were used to determine the altitude of UNC medium bombers to ground batteries.

Target Defense

In the early part of the war the North Koreans did not use their few antiaircraft guns in a strong defense of the most important objectives. Their policy was to establish a token defense for as many targets as possible. The result was a widespread network which sacrificed the effectiveness of concentrated fire patterns.

Improvement in the use of antiaircraft guns was noticeable in 1952. But gun batteries were still emplaced very close to the target and batteries were sometimes as little as 200 to 300 yards apart. Sighting guns close to the target put the greatest portion of B-29 rectilinear flight during bomb runs in the outer, less accurate limits of gun range. After "bombs away," evasive action



The enemy threw up heavy anti-aircraft defenses around major airfields until convinced such defenses would not halt the incessant, determined air attacks. Here an 8-gun heavy anti-aircraft position was located several hundred yards off one end of the runway at Sinuiju airfield near the Yalu River. This photograph was taken early in the war, yet the battery was already equipped with precious gun-laying radar (arrow). When the enemy removed his anti-aircraft defenses from Korean airbases in mid-1952, only this airfield and those in Pyongyang retained their defenses.

by the aircraft largely defies the prediction necessary for accurate pointing data.

The Reds apparently studied the direction of attack by UNC medium bombers and used their findings in relocating their heavy defenses. At the Suiho Dam and the Sinanju bridge complex the guns were not emplaced for all-around defense but to cover fully the limited approach routes afforded by radar bombing techniques. The cities of Pyongyang and Sinuiju offered examples of improved all-around defenses.

For the most part, gun fire was meager to moderate in intensity. Accuracy was poor, with most fire delivered by barrage or predicted concentrations. Attacks in northwestern Korea usually received moderate to intense fire, with a greater frequency of accurate shooting. Except in large-scale or repeated attacks upon the same target, gun fire was ineffective against B-29's. Anti-aircraft fire usually mixed with that from AWs, did contribute to attrition of fighter-bombers.

The Soviet 37-mm, was the principal anti-aircraft automatic weapon. Fire control was manual, with an on-carriage computing sight. Initial data set into the sight included range, target speed, and target course. Then correct deflection for azimuth and elevation were computed and transmitted to the reflex sights. The sights accommodated target speeds of up to 300 mph and ranges of from 220 to 4400 yards. Automatic weapons were much more effective than anti-aircraft artillery guns. Operation is simple, comparable to directing a stream of water from a hose. Their short range and high muzzle

velocity meant that the projectile arrived at the target little affected by ballistic conditions. The crews were in continuous training against "live targets."

The 12.7-mm Soviet DShK, M-1938, a dual-purpose, single-barrel machine gun, was used for both antiaircraft and ground firing. A "speed ring" sight enabled the gunner to determine approximate initial leads and to adjust his fire on the target by observing the flight of tracer bullets. The effective slant range of this weapon was considered to be 600 to 800 yards because the gunner could not adjust his fire by tracer observation at longer ranges.

Small arms of all calibers were also used against aircraft. Here effectiveness depended upon a volume of fire in the path of the plane. Special "killer squads" were trained to fire on aircraft that came within small-arms range. They developed tactics such as holding their fire until the attacking aircraft began to level off from a dive and of permitting aircraft to pass over the target before firing. Automatic weapons, machine guns, and small arms took advantage of hills and ridges as positions for shortening ranges to targets. Only rarely did heavy guns follow this procedure.

Sporadic reports were received on the use of ground-to-air rockets beginning in October 1951, but these reports faded out after December 1952. Antiaircraft rockets were reported to have been fired singly and in groups of from two to sixty. Detonations were said to have occurred in most instances between 10,000 and 11,000 feet altitude and sightings of explosions were reported as high as 50,000 feet. Most of the engagements indicated that the rockets in use were probably the World War II Soviet 82-mm unguided rocket and the 132-mm ground-to-ground rockets. Some reports described encounters with antiaircraft rockets with characteristics similar to German types known to have been acquired by the U.S.S.R.

Communist flak traps repeated all the World War II tricks, including the use of damaged, destroyed, or dummy equipment for bait. Tracks were purposely made to encourage attack, cables were stretched across mountain passes or roads in the expected flight path of aircraft, and lights were used to simulate convoys during darkness. Usually flak traps were well covered by concealed antiaircraft weapons,

Effectiveness

THE enemy's antiaircraft defenses had some success. Most of the loss and damage sustained by UNC aircraft was inflicted by AW and small arms, particularly on the large segment of missions devoted to interdiction and close support. But as Fifth Air Force effective combat sorties mounted continuously, attrition rates declined, particularly in the loss and minor damage columns. FEAF Bomber Command sustained no losses to enemy ground fire after October 1951, when combat operations were switched from day to night. Major and minor damage was low, mostly received in large-scale B-29 attacks on targets with heavy concentrations of antiaircraft weapons.

It was evident that UNC air operations seriously hurt and hampered enemy activities throughout North Korea. The Reds made every effort to protect important objectives. The Soviet Union furnished the Communists in North Korea with all their antiaircraft weapons. That this equipment was obsolete and consequently not too effective shows that the U.S.S.R. had no intention of making Korea a "showcase" for its latest weapons. The

tactical employment of anti-aircraft weapons in Korea followed Soviet doctrine and was taught to the North Koreans and the Chinese Communists by Soviet artillery advisers. Soviet technicians were on hand to provide maintenance of technical equipment such as GLR and directors. Soviet anti-aircraft artillery troops were employed in the northwest sector, and in smaller numbers around Pyongyang.

The weakness in the over-all effectiveness of enemy anti-aircraft defenses could have been corrected by better planning and more equipment. Results would have been much more significant if modern weapons, fire-control systems, and ammunition had been made available to the enemy.

Headquarters, Far East Air Forces

German Antiaircraft Defenses in World War II

Dr. Frank W. Anderson, Jr.



Massive Antiaircraft Fire . . .

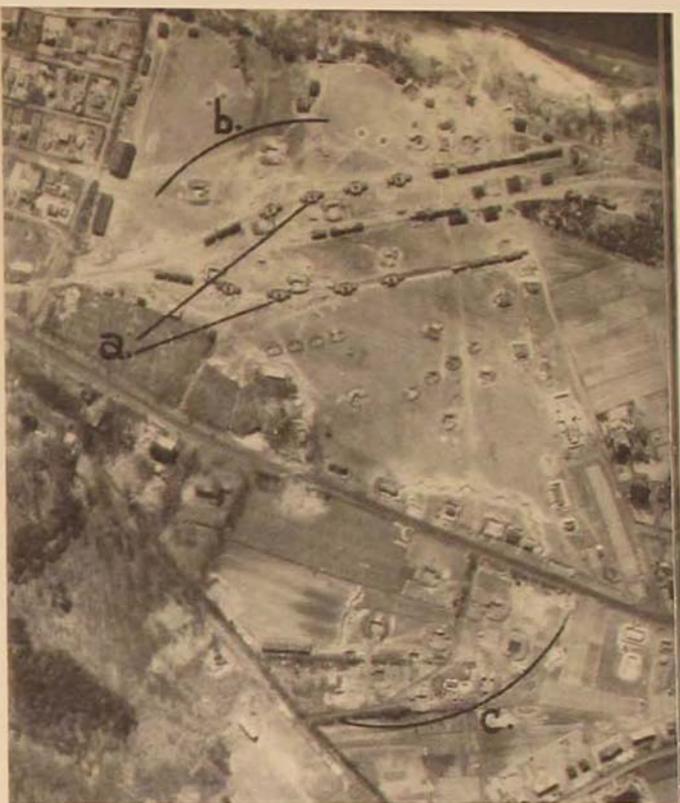
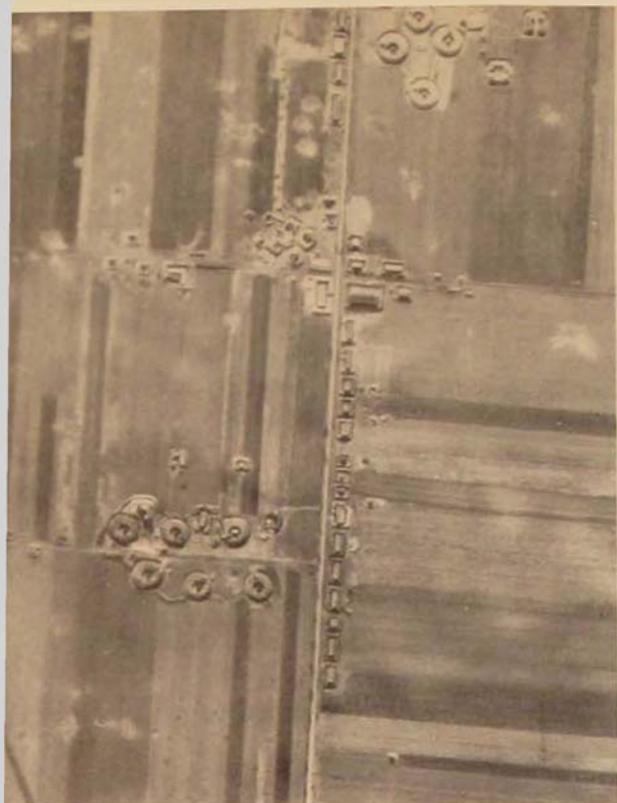
. . . vs Massive Aerial Assault

Major Soltys' analysis of Communist antiaircraft defenses in Korea reports many of the same frustrations encountered by the Germans in their attempts to deny or divert Allied air attacks on important targets. Although the Germans had much greater quantities of antiaircraft equipment than did the Communists in Korea, they also had many times the number of critical targets to protect and thousands more aircraft to repel. The history of German antiaircraft employment was one of constant lag of defense behind offense. From a few four or six-gun heavy batteries scattered around important targets and relying largely on searchlights and manual tracking to furnish information to the battery's predictor, the Germans by late 1944 were massing as many as forty heavy guns in a *grossbatterie*, encircling crucial targets with two or three rings of the monster batteries and using two radars to feed information to the battery predictors. Still they failed to stop the Allied bomber offensive.

To compound their technological lag in radar development—throughout the war German radar was two years behind the level of Allied equipment—was added the Allied offensive techniques of high-altitude bombing, saturation raids, and radar countermeasures. The famous 88-mm gun comprised some 70 to 80 per cent of Germany's heavy-flak defense, yet only the new 88-mm/41 was effective at altitudes above 26,000 feet. By 1944 Allied air attacks had become so massive that no amount of defense could engage all the air elements during the critical seconds of the bomb run. Tacit admission of the increased weight of Allied attacks is found in the German flak manuals. In 1943 and early 1944 a nuisance raid was defined as an attack by 5 to 10 aircraft; by late 1944 a nuisance raid was an attack by 50 to 80 aircraft.

Although German antiaircraft defenses failed to stop the Allied air offensive in World War II, they did exact a heavy toll. In 898,758 effective sorties in the European theater of operations, American air forces lost in action a total of 11,687 combat aircraft. Of this total, enemy flak accounted for 5380, while enemy aircraft shot down 4274. Of 5548 heavy bombers lost, flak accounted for 2439, enemy aircraft for 2452. In raids against the most heavily defended targets, heavy-bomber losses to flak rose to even higher percentages. The synthetic oil plants at Leuna were probably the most heavily defended target in Germany, with over 500 heavy guns bristling in rings around the 3 square-mile area. In 22 strategic attacks against Leuna the Eighth Air Force lost 128 aircraft, 62 of them to antiaircraft fire. This amounted to 75 per cent of the explained losses.

On 7 May 1943, the day German representatives signed the documents of unconditional surrender in a schoolhouse at Reims, a U.S. reconnaissance plane swooped low over the formidable antiaircraft defenses surrounding the synthetic oil plants at Merseberg-Leuna. Twelve 88-mm guns—six in the center, six in the other battery in the left background—point blindly toward the horizon, mutely testifying their failure to defend Germany's vital oil production from the Allied aerial armadas.



Two types of German anti-aircraft batteries. At the left, two six-gun heavy batteries are operating from a central command post. While each battery has eight emplacements, two are of the older, smaller type not rebuilt when the battery was reworked and equipped with the larger 128-mm guns. In addition to the command post, containing radar, range finder, and predictors, each battery has its revetted ammunition bunkers and crew quarters. At the right is an eight-gun heavy railroad-flak battery. Four 105-mm guns are in firing position on each of two parallel railroad spurs (a), while on the track between the spurs the ammunition cars stand mounted with light flak guns for protection against strafing. The spurs have been laid through an abandoned eight-gun battery position (b), part of a double battery (the other set of abandoned emplacements can be seen (c) below the road at bottom). Railroad flak was a particular nemesis because it could be wheeled into position overnight to provide a sudden, unpleasant surprise for attacking aircraft.

The defenses at Leuna offer a good example of German anti-aircraft techniques in their final development. In concept the number, size, and placement of anti-aircraft batteries is usually determined by the objective of the defender. Does the defender want to destroy the attacking force or only to deter it from bombing that particular target? If he wants to drive off the attacking aircraft, his batteries are small, widely spaced, and on or in front of the bomb release line (BRL). If he is trying to destroy the attacking planes, his batteries will be large and dense, with an inner ring of batteries inside the BRL. The latter concept prevailed in Germany and had its ultimate development at Leuna.

Before 12 May 1944 there had been no large-scale air attack on these synthetic oil refineries deep within Germany. Consequently the flak defenses were light—68 heavy guns near the target for limited all-round defense. These guns were placed so that they could engage aircraft coming from any direction just before they reached the BRL. The first large Allied raid penetrated these defenses with ease. Since it was by then apparent that the Combined Bomber Offensive was embarking on an all-out campaign against

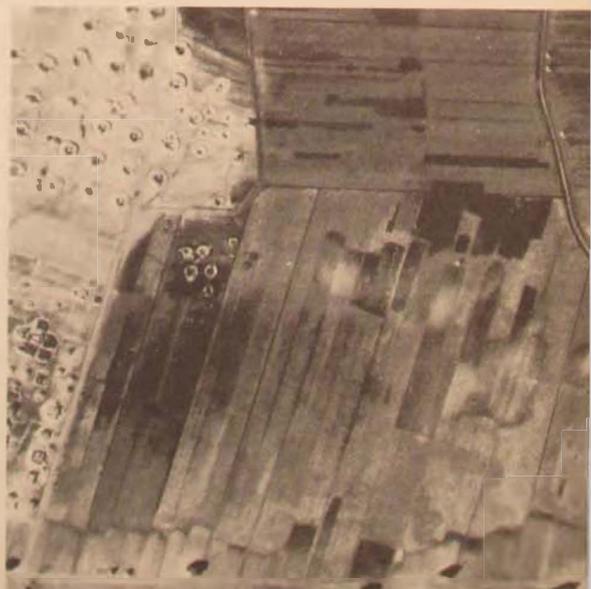
German oil production, the Germans immediately began an intensive reorganization and strengthening of Leuna's defenses. By November 1944 over 500 heavy guns were firing at Allied formations over Leuna. Assuming that bomber attacks would average a height of 8500 yards, the Germans calculated the BRL to be 5300 yards out from the target. To obtain maximum concentration of fire for as long as possible, a ring of 88-mm/37 gun batteries was placed just ahead of the BRL, another of 105-mm guns on the BRL, and batteries of 128-mm and the newer 88-mm/41 guns were placed halfway between the BRL and the target, since these guns had the range to fire ahead of the BRL in all directions, even from this interior position. Wherever terrain permitted, the guns were grouped in *grossbatterien* of 18 or 24 guns. Later some of these were further consolidated into 32, 36, or even 40-gun batteries.

German figures proclaimed the Leuna defenses a triumph: while the Allied bomber attacks on Leuna continued at the rate of three or four large raids per month until the end of the war, the percentage of bombs on target slipped from 35 per cent on 12 May 1944 to 8 per cent in June, to 5 per cent in July, to 1.5 per cent in September. For the three mass attacks in October 1944 the Germans reported a zero percentage of bomb hits. Later the percentage rose when the hard-pressed German army had to withdraw some of the guns, and many of the crack gunners were replaced with inexperienced troops.

But these figures do not represent the complete story, since the bad weather of the fall months of 1944 frequently prevented visual bombing, and radar bombing was at that time too primitive to be accurate. Also the later attacks were harassed by some of the hardest-pressed and most desperate fighter attacks mounted by the Luftwaffe during the entire war. But there can be no doubt that part of the bombing inaccuracy was caused by the curtain of anti-aircraft fire. In the final analysis the tremendous anti-aircraft defense of Leuna was defeated by an even more tremendous bomber force. Although 62 bombers were shot down in the 22 attacks on Leuna, the loss rate remained well under the five per cent attrition that would have been necessary to wear down the strength of the Eighth Air Force. The attacks continued. The target was destroyed.

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A 32-gun grossbatterie in the Merseberg-Leuna anti-aircraft defense ring. Down the road from the monster battery is the command post with its two radar, range finders, and predictors. When batteries reached this size, they were in danger of becoming targets in their own right.



Early Troop Carrier Operations in Korea

COLONEL EDWARD H. NIGRO

FOR three or four years after Korea was divided along the 38th parallel, the North Koreans displayed their discontent in a series of general disturbances and warlike activities along the entire border. On 25 June 1950, when the Red Koreans whooped and shouted and dashed across the 38th parallel, it was considered another of those nuisance raids which would end with the Reds immediately dispersing after a short skirmish. The error in this estimate of the situation was quickly apparent. The disorganized, untrained Republic of Korea border forces were overrun and completely routed by the North Korean Army. If the Reds were trying to take the ROKs and the Americans by surprise, their success was unquestionable. When the retreat turned into a rout, Brig. Gen. Church, chief of the American advisory group to South Korea, and his entire detachment, including their dependents, were in the path of this Pusan-bound Korean army. Without accurate information and in the midst of this general confusion, troop carrier received its first mission of the Korean conflict—to evacuate dependents and civil service workers from the Seoul area immediately.

Two very pertinent factors played a large part in the early days of troop carrier operations in Korea:

(1) Troop carrier strength in the Far East consisted of one C-54 group composed of three squadrons, two of which were located in the Tokyo area and the third at Clark AFB in the Philippines.

(2) It was believed that this insignificant guerrilla-type North Korean army which had crossed the 38th parallel would not have the presumption to make complete victory over South Korea its objective.

I mention these items because they indicate both the limited force which was available to troop carrier in June 1950 and the general disbelief, amidst defeat and confusion, that the situation was actually critical.

The Frantic Period

TO bolster the evacuation effort, the C-54 squadron at Clark AFB was immediately ordered to Japan. The C-54's in Japan started the first air evacuation in the Korean conflict. Little was it realized how many times this would be repeated on a much larger scale in the next 12 months. The C-54's flew into Kimpo Airfield around the clock, evacuating personnel and critical equipment. The North Korean Air Force was in being at the time. Although it was admittedly not a very effective striking force, it had at that time a free reign in the Seoul area. All dependents and civil service workers were successfully evacuated either by air or water. The military advisory group was migrating south, slowing down from time to time, seemingly not convinced that they were really being chased by an enemy army which was shooting to kill.

Shortly the speculations, such as "they wouldn't dare," "our airplanes will blast them off the map in a week," and "another gang of Huks kicking up a little fuss," were dispelled from the minds of all, and the famous Maj. Gen. William Dean was making a death stand with his 24th Division. The picture began to come into focus revealing that, like it or not, we had ourselves a war. It was obvious that the personnel and supplies needed in Korea were late as it was, so airlift was at a premium from the beginning. All the C-47's and C-46's that could be found in the Far East were thrown into a so-called organization, temporarily named the 21st Squadron or the "Kyushu Gypsies." Soon there were sufficient "gooney birds" and C-46's to form two organizations, and the C-46 squadrons were organized as the 1st Provisional Group. Both of these organizations later went on to make history in

A C-46 coming in for a muddy landing on a short, soggy strip typifies the conditions under which troop carrier aircraft operated in the early Korean War. Too few aircraft, flown by a handful of fatigue-ridden pilots, operating out of primitive, dangerous strips, has the crushing task of evacuating stranded Americans in the first attack by the North Korean Communists in June 1950, of paratrooper drops and resupply to the lightning advance of the Eighth Army late in 1950, of evacuation of Army and Marine troops at Kimpo and Yonpo after the disastrous defeat of the Eighth Army in December 1950, and again of resupply to the U.N. counteroffensive in spring 1951. Colonel Edward H. Nigro, who was Assistant Chief, Combat Operations, Headquarters, FEAF, and later commanded various troop carrier groups early in the Korean War, gives a personal view of the beginning months.

Korea, the 21st Squadron reaching its pinnacle in the evacuation of Sinanju, Pyongyang, Yonpo, and Seoul.

The total airlift available shortly after the war began was two squadrons of C-54's (the earlier losses in C-54's made it no longer possible to equip three squadrons), two C-46 squadrons, and one C-47 squadron. The C-54's were manned by qualified air crews. All other troop carrier aircraft were flown by rated personnel called into action from their former assignments as PX officers, personnel officers, administrative officers, or from any other place they could be found.

An efficient and sound system of allocation of priorities and intra-service space was not in effect because of the newness of the operation and the existing psychological attitude toward the Korean affair. In the late summer of 1950, through the combined efforts of numerous troop carrier specialists, the seed was planted for the growth of an organization capable of airlifting or air-dropping personnel and supplies within the specific concept of sound troop carrier procedures. This structure soon grew to be that going concern called Combat Cargo Command.

Amid the toils, heartaches, and sweat of the early days of the Korean conflict, the "whys" and "how much's" of airlift were uncertain. When the North Korean Army was bearing down on the 24th Division with all its fanatical might, General Dean's men needed more concentrated and devastating firepower to stop the enemy. An emergency call went out for larger artillery pieces and their necessary ammunition. The ammunition was received in Japan almost immediately. In spite of generally miserable weather, troop carrier crews flew 24-hour-a-day schedules into forward strips to get the ammunition to the front lines. Unfortunately the ammunition had been shipped more promptly than the artillery pieces, and there was not a gun in Korea capable of firing the "triple A priority" ammunition. To further complicate matters, the American forces were rapidly losing ground. The only alternatives were to destroy or re-airlift the ammunition. The ammunition airlift went into reverse. All that could be saved was flown out before the enemy overran the friendly forces. Who can gauge the cost of these early lessons? Who can say what the military situation could have been if the items that were requisitioned for simultaneous use were simultaneously and promptly received?

The North Korean Army was finally stopped at the Taegu perimeter. To say that the American forces were just barely "in" is an exaggeration. During this period troop carrier operations

returned to more nearly normal. Although the enemy was in the traffic pattern of Taegu and Pohang, troop carrier continued round-the-clock operations into these airfields bringing in the necessary personnel, supplies, and equipment to assist the American forces in holding their ground.

The First War Is Over

WHEN the American forces had amassed sufficient personnel and logistic support to lash back at the North Koreans, the time was set for the "big push." Combat Cargo Command stood ready to fulfill one of the most difficult missions yet assigned. The mission was twofold: first, with a complete lack of adequate airfields to which supplies could be delivered, to provide airlift support to an army about to advance with incredible speed; and second, to air-drop a regimental combat team behind the retreating enemy to cut off and destroy as many units as possible. The tools available to Combat Cargo Command for this gigantic task were diminutive by comparison with the job. In total, there were three squadrons of C-119's, two of C-46's, two of C-54's, and one of C-47's. To meet the mountainous demands for airlift, all the aircraft had to be stacked on the southernmost tip of Japan and wherever they could be "staged" in Korea, so that a minimum gas load would allow a maximum pay load. With the meet-the-deadline plans complete, Combat Cargo was ready to move. General Walton Walker (later killed in a jeep accident in Korea) had his Eighth Army poised and ready. When the "green light" was given for the Eighth Army to jump off, the doughboys went "hell bent for leather." The Notre Dame football team rolling over Central High School would be an accurate comparison.

As soon as the Eighth Army passed Seoul, two squadrons of C-46's were sent into Kimpo Airfield, from which they operated for two months. The Kimpo location reduced the required gas load and proportionately increased the pay load and speed of delivery of the loads. At the same time C-119's and C-47's were marshalled to make the first paradrop mission of the Korean conflict. Men from the 187th Airborne Regimental Combat Team were dropped at Sukchon, Korea, immediately behind the main force of retreating North Koreans. The 187th successfully cut off and destroyed thousands of enemy troops, further ensuring a complete rout of the North Koreans.

The C-46 operation out of Kimpo was generally of the old World War II style. The 1st Provisional Group kept 16 opera-

tional C-46 aircraft at Kimpo. The remainder were in Japan, where there were facilities for major inspections and field maintenance. Thirty-two crews were assigned to this group, and since a 24-hour operation was essential, crews were divided into two schedules: from noon to midnight, and from midnight to noon. With no spare crews available this schedule was necessarily in effect seven days a week. Pilots of the 1st Provisional Group were averaging 125 hours a month in intra-Korea flying. Airfields and terrain in North Korea were completely unknown to American pilots. To say the operation was hazardous would not be an exaggeration. Yet from 12 November 1950 to 5 January 1951 this C-46 group flew 6500 hours in Korea without suffering an air or ground accident. Some of the conditions in Korea which made this record outstanding were the inadequate airfields, the lack of adequate night lighting on the airfields, the lack of adequate navigational and traffic control aids, and the lack of obstruction markers on very decided obstructions in the immediate vicinity of unfamiliar airfields. In the face of these hindrances the 1st Provisional Group operated without one non-flying day for the entire time at Kimpo.

Flying round the clock day in and day out can become very boring. Pilots are bound to seek some outlet for their boredom, and the kind of outlet they select can be one of the determining factors in an organization's success or failure to perform its assigned mission. For example, in the early days in Korea traffic control of aircraft was far from adequate. Pilots were forced to institute their own controls, both for the flight spacing and stacking at destination. After a few hundred hours of this type of flying, pilots soon develop an independent and distrustful attitude toward all control. The inherent dangers of this method of operation were realized, and adequate control was provided as soon as it could be done. In the interim, as an outlet to their boredom, some of the pilots became self-appointed controllers. So "proficient" did they become that had adequate traffic control not been instituted at the time it was, the flying safety record of Combat Cargo would certainly have suffered a lapse. In any event the pilots then looked for something else to occupy those long, weary days and nights of shuttling between North and South Korea. Most of the intra-Korea flying at night was done by the 1st Provisional Group. The pilots of this organization turned to poetry for relief from their boredom. The control tower operators, apparently in the same mental state, immediately joined the pilots in their pursuit of Byron, Shelley, and Keats. Before traffic be-

came heavy in Korea it was not unusual to hear the black night interrupted by extremely unorthodox radio transmissions:

Kimpo tower from four four eight
Better hurry, it's getting late,
We're the boys behind the glass,
Give us the nod, and we'll give it the gas.

Kimpo tower would probably answer something like this:

Read you clear, four four eight,
Your clearance so you won't be late,
I understand you're clear to go,
You're clear to cruise at nine point 0,
So pull up your boots and tuck in your socks,
You're clear to climb. Out Victor Fox.

The breach of radio discipline in proper radio procedures were apparent, and corrective measures were taken before it got out of control. At the same time an understanding of the conditions under which these pilots were flying provided sufficient extenuation to allow them to continue their little game as long as traffic was so light that no radio interference was cause.

And there comes a time where though the spirit may be willing, the flesh is weak. Colds, sinus trouble, and general respiratory illnesses took their toll among the pilots, even though they flew when they would normally not get a foot off the ground. By the time the operation at Kimpo was ended, 17 aircraft commanders were on a "duties not involving flying" status. Those who were still flying were starting to regard this extremely hazardous operation as a normal one. That alone emphasized the need for caution. Most rigid supervision and special emphasis on flying safety were of utmost importance.

The New War

ON 28 November 1950 the hopes of the United Nations Forces in Korea that peace was in sight were shattered when thousands of Chinese Communist "volunteers" charged across the Yalu River into Korea. They came in such multitudes and with such ferocity that the U.N. forces, badly extended from their dash to the Manchurian border, had no choice but to retreat and regroup. Whether the army is advancing, retreating, or remaining stationary, troop carrier must have an operational plan to fit. It is hard to say whether rapid advance or hurried retreat imposed a greater strain on troop carrier capability for air support. The U.N. forces were moving south in an attempt to establish a defense line. If this line was to be established, they must move rapidly to gain

enough lead time to regroup without suffering a major attack. No grass was growing under the feet of the Chinese Communists. It was quickly obvious that the materials and supplies which troop carrier had just airlifted to the front lines must be destroyed and left behind. To re-airlift and to conduct emergency air evacuation simultaneously was simply beyond the capability of troop carrier in the time available.

Almost immediately troop carrier became responsible for the major part of all evacuation of forward hospitals and of non-combat or technical units. The first job was to evacuate the wounded from the hospital at Sinanju, some 20 miles south of the Yalu River. There was no time to procure sufficient vehicles to evacuate all of the wounded to the airstrip. In bitter cold, many degrees below zero, the three miles from the hospital to the strip had to be negotiated somehow. The wounded who could not walk were put into available vehicles or carried by their buddies to the waiting aircraft. Anyone who could walk or hobble made the three miles the best way he knew how. When they arrived at the aircraft, they were clad in pajamas, shorts, blankets, or any other garments they could snatch up on the way out to keep them warm. Sixty to seventy wounded were loaded on each aircraft and flown back to Pyongyang where they could get proper attention. When the evacuation in Sinanju was finally completed, the Chinese had already by-passed the strip and were 10 miles to the south. This was the warm-up for the several evacuations to follow. Pyongyang was next on the list. Everything went very smoothly, and every last item that could possibly be airlifted was carried south. The evacuation of Yonpo, on the East coast, was a little different story. Beginning with the evacuation of the Marines at Hagura-ri to the final evacuation by air and water out of Hamhung, it was nip and tuck all the way. What began as a normal troop carrier operation became one of the greatest feats of troop carrier in the Korean conflict. The completely surrounded Marines had to fight their way out of encirclement to get to Hamhung for evacuation. Their supply of food, ammunition, and warm clothing was rapidly being depleted. The casualties from enemy action, plus the inestimable number of men who were badly frozen, put troop carrier air evacuation to a real test. Combat Cargo C-199's, C-47's, and C-46's went to the rescue with all they had. C-119's dropped the major part of the necessary supplies in a dawn-to-dusk operation. From a small strip hacked out in the snow and ice C-47's of the 21st Troop Carrier Squadron performed one of the most difficult and dangerous missions since its inception. The Reds were

in the hills all around the Marines, constantly pouring artillery and mortar shells on them. In the midst of their fire USAF C-47's evacuated all the wounded from the reservoir to Hamhung where the troops could receive adequate medical attention. The aerial resupply kept up constantly until the Marines had sufficient arms, ammunition, and food to start their fight-or-die retreat to Hamhung. As was the usual procedure, a representative of Combat Cargo Command performed over-all supervision of the evacuation, directing all air movements to insure that all ran smoothly and efficiently. As the Marines made their way into Hamhung, they were loaded on planes and ships for immediate evacuation to southern bases. The Reds were hard on the heels of the retreating Marines. U.S. Army artillery and tank outfits surrounded the airstrip at Yonpo for necessary defense, constantly staving off the enemy while Combat Cargo frantically evacuated personnel and critical materials scheduled for air evacuation.

With Hamhung finally in their hands, the Chinese moved south to Seoul, and for the second time, battered Seoul was put to the torch. Again Combat Cargo aircraft evacuated the fighter units at Kimpo and all supporting personnel and necessary equipment. The First Provisional Group evacuated itself from Kimpo after all other air evacuation was completed.

The Road Back

AFTER retreating about 50 miles south of the 38th parallel, the U.N. forces decided that a definite defense line could be established. The airfield at Suwon was completely surrounded by the Reds. It had to be held at all cost since the next semi-adequate airstrip to the south was 125 miles away. The bloody battle that ensued saved Suwon and troop carrier aircraft flew into the strip in a steady stream, carrying necessary personnel and materials to further assist in providing for the security of the airstrip and the established defense line.

In central Korea the Reds were forcing a large-scale offensive in an attempt to split the U.N. forces. The U.N. forces were fighting back ferociously, but the spring thaw had converted the roads into winding strips of mud. Normal surface supply came almost to a standstill. The only alternative was to air-drop or air-land supplies to the friendly forces, since they were running out of food and ammunition. The only air strip in the area was Chungju, a 2400-foot sod strip along the bank of a river. This

landing field was far from adequate, and it would have been best to resupply the ground forces by aerial delivery. But the battle had reached such proportions and ammunition was being expended at such a rate that the C-119's could not air-drop supplies in sufficient quantity to satisfy the demand. So the decision was made to operate C-46's into the airstrip at Chungju immediately. The situation was so critical that there was no time for aviation engineers to be brought in to improve the strip. We had to take the calculated risk and accept the losses which would undoubtedly be incurred from an operation into such an inadequate strip. To add to the obvious difficulties, another last-minute mishap occurred which was unknown to any of the pilots. On the eve of the operation into Chunju, the temperature soared well above freezing and a little rain fell on the strip. The sod got soft and muddy to a depth of about two inches, and below that was a solid sheet of ice. The C-46 operation commenced at first light and continued in a steady stream the entire morning. Then disaster struck. A C-46 landed too short, sheared one gear, and plowed through two other C-46's parked immediately adjacent to the strip. Two pilots were killed and another airman injured. The wreckage was immediately cleared and the operation continued. A total of six C-46's were lost at Chunju in the first two days of operation. The situation at the front became sufficiently stable after approximately eight days of operation so that this hazardous operation could be abandoned.

U.N. forces were gradually developing into a solid fighting force of sufficient numbers not only to hold off the Reds but to launch an offensive. This they did. In coordination with the ground force offensive C-46's and C-119's of Combat Cargo Command air-dropped the 187th Regimental Combat Team approximately 20 miles north of Seoul near a town named Munsan-ni. The objective of the 187th RCT was again to cut off the enemy in their retreat and to destroy as many of them as possible. Neither pathfinders nor any other navigational aids were used by Combat Cargo aircraft on this mission. Approximately 4000 paratroopers were delivered to the drop zone, and they carried out their mission as assigned. While not all of the aircraft were accurate on the drop zone, they were not sufficiently off to detract from the achievement of the objective. This drop did give an indication of the flexibility required of troop carrier organizations. All units concerned with the mission had been briefed for a drop at Chunchon, Korea. By the time this mission was to take place, the enemy had already retreated beyond the selected drop zone. Twenty-four

hours later the 187th was dropped at Munsan-ni. This was a concrete demonstration that troop carrier must be able to change a mission on a moment's notice and quickly re-project it to another drop zone. It also indicated the extremely close liaison required with the airborne units, air-ground support units, and the ground forces.

Shortly after the Munsan-ni drop the first overture to a possible cease-fire was made by the Reds. The peace talks started, and for all practical purposes the fighting stopped. Once again the versatility and flexibility of Combat Cargo was demonstrated. Troop carrier transitioned from a combat operation to an airline and cargo-carrying operation. Airfields were sufficiently improved to make operations safe and normal. Every kind of navigational and let-down facility was brought into operation in Korea. This is the position in which we find troop carrier today. Approximately 80 per cent of the airlift capability of Combat Cargo is carrying out an extensive rest and recreation program to Japan for the ground forces. The remainder carries air evacuation patients and priority cargo.

Troop Carrier Today

SINCE the arrival of C-124 type aircraft in the Far East in early 1952 the total number of aircraft required for airlift has been steadily diminishing. The C-124 is replacing C-54's at a ratio of one for three. This new aircraft has proved to be a very versatile and competent plane in every respect. As with every new airplane, there were "bugs" in it that must be corrected. In the Korean operation it is getting one of the most rigid "debugging" tests possible.

The utilization of the C-124 in Korea has proved two very essential points. First, in order to get the most from an aircraft of this size, loads must be pre-planned in accordance with the C-124 load diagram. Proper packaging of the load greatly simplifies this problem and reduces the time expended in loading. This was realized by responsible personnel in the Korean operation, and a loadmaster course was instituted to train the "ground handling" personnel as well as the crew members. Secondly, and in conjunction with pre-planned loads, most effective utilization of the C-124 requires the loading personnel to maintain an accurately accounted temporary or short-time backlog. This would preclude the possibility of an aircraft capable of carrying 17 tons

flying one leg of a project relatively empty. If there is no temporary backlog in Japan, for example, and priority cargo is waiting pick-up in Korea, it is obvious that the result is a certain amount of wasted airlift. Through adequate and thorough pre-planning, this non-productive flight time can be held to an absolute minimum.

It is essential that the Air Force closely observe the C-124 in operation in Korea and accurately record and take corrective action on all discrepancies. The operating unit in the Far East had the airplane only a short time when it realized that it had wasted thousands of man hours and dollars by not being furnished information which units in the United States had gained through their early acquaintance with C-124. It is imperative that the wealth of information gained in the Far East relative to this new aircraft be utilized by other organizations.

Most of the difficulties encountered with the C-124 revolved around maintenance. If, for example, the operating unit in the Far East had been provided with copies of all the Unsatisfactory Reports submitted on the C-124 by the organizations initially receiving the aircraft, together with corrective action recommended by Air Materiel Command and the Douglas factory, an important number of man hours and dollars would have been saved. There are undoubtedly acceptable administrative procedures for achieving this, but unfortunately this was not done with the C-124 in the Far East.

In the years after World War II, newspapers carried numerous articles which relegated to obsolescence the old-time idea of paratroopers. Yet in the Korean War, and any other war in the immediate future, paratroopers will necessarily be used time and time again. Aerial supply and resupply have definitely proved essential in any operation in which the doughboys are involved. What progress, then, has been made in troop carrier procedures since World War II? The answer obvious to the troop carrier veteran of World War II and the Korean conflict is that there has been extremely little progress, with the possible exception of greater ease in aerial delivery brought about by the C-119's. Paradrop procedures remain identical to those utilized in World War II. If there has been a successful device produced to assist aircraft in finding a drop zone in mountainous terrain under mandatory low-level flight conditions, it has not been made available to Combat Cargo in the Korean conflict. With the development of omnirange, and all types of portable radar and radios, it should not be out of order to visualize a radio aid especially

adapted to troop carrier to make navigation into a drop zone an unerring maneuver.

The aerial delivery of supplies to front-line ground force units is almost identical to World War II. Ground force units in Korea used panels to identify the drop zones for the pilots. Rarely were the panels in the pre-briefed location, and more than often they were set up in an inaccessible valley on a postage-stamp-size drop zone. Another unfortunate feature of panels was discovered when attempts were made to resupply a unit located fairly close to other units. Once a unit realized what wonderful gifts the little panel would bring them, the situation became increasingly worse. Every time Combat Cargo aircraft approached the front lines, Tom, Dick, and Harry Doughboy ran for their panels and spread them neatly on the sod to see what their friends from the Air Force had in all those packages. In that jagged Korean terrain the pilots would have to be nothing short of geniuses to distinguish which was the proper drop zone. Mosquito aircraft were occasionally successful in overcoming some of these obstacles, but fighter missions made such constant use of mosquito aircraft that there were rarely any available for troop carrier.

This whole problem could be resolved by close coordination and liaison between the Army and the Air Force. A firm and sound procedure for the allocation and use of panels, one that is understood and followed by all, will bring the supplies to the proper drop zones. Also proper liaison could readily instruct Army personnel to deal with the very few factors that must be considered in the selection of a resupply drop zone. It is not necessary to have a complicated, expensive system for drop zone identification. It would be no more suitable than the simple one, if there is not complete understanding between the Army and Air Force units. Aerial resupply is as much a joint operation as a paradrop, an amphibious landing, or any other operation in which more than one service is involved. With the same amount of prior coordination that goes into other joint operations, aerial resupply could be changed from a hazardous and frequently non-productive operation to a routine, efficient maneuver.

With the establishment of the Eighteenth Air Force, Troop Carrier should again find a home where adequate research and development of new procedures may be made by qualified experts. A wealth of experience has been gained in Korea, but the greatest lesson has been that troop carrier is far behind in all phases of its operation because of the standstill between the years of 1946 to 1950.

Every opportunity is now afforded troop carrier for an "Operation Bootstrap." The lessons learned in the Korean conflict should contribute immeasurably to the advancement and adoption of improved, practical troop carrier procedures. Complete evaluation of historical data is extremely essential. Troop carrier should personify "versatility and flexibility." It is an integral part of the U.S. Air Force and should remain so for many years to come.

Armed Forces Staff College

Air War in Korea: XI

HEAVYWEIGHTS OVER KOREA

B-29 Employment in the Korean Air War

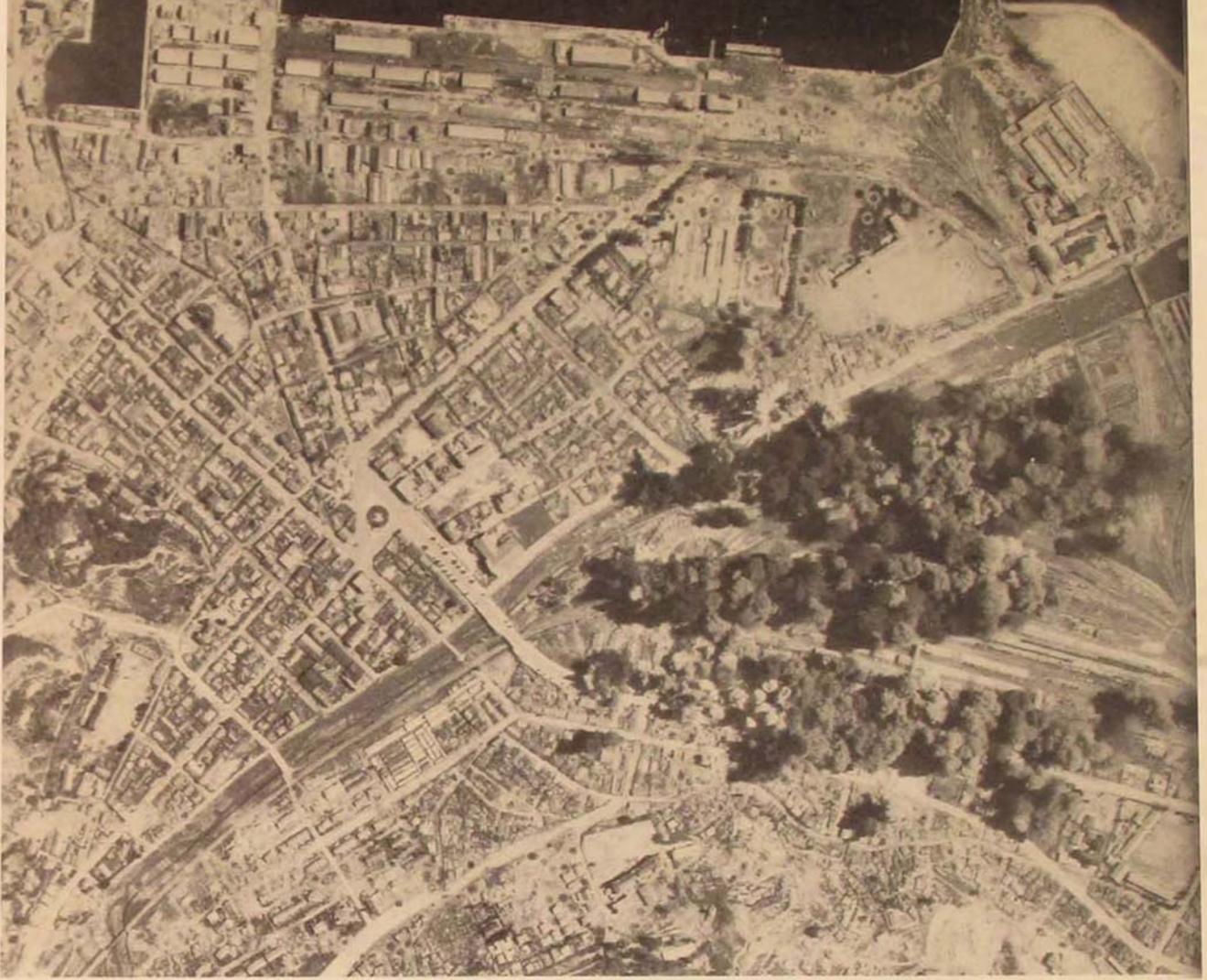
ON 25 June 1950, when the North Korean armies poured south across the 38th parallel, it was immediately obvious that the air counteroffensive would have to rely heavily on long-range bombardment, since it was doubtful that even such South Korean air facilities as then existed could be retained. Only one bombardment unit was available for such operations in the Far East. This was the famous 19th Bombardment Group, immediately redeployed from Guam to the more favorable location of Okinawa.

Reinforcement of this single B-29 wing could come from only one source—the ZI-based B-29 wings of Strategic Air Command. The Joint Chiefs of Staff and the Air Staff moved swiftly to effect this reinforcement. The move which followed demonstrated one of the first and most important lessons of the Korean air war: the Strategic Air Command mobility concept was wholly valid and practicable.

Even as the 19th Group was delivering its first strike on the North Koreans, short hours after the President had directed resistance to the Communist aggression, the Air Staff had flashed its warning orders to SAC at Omaha. Immediately Major General Emmett O'Donnell, with a small group of key officers, flew to Japan, where on 7 July he set up the provisional Bomber Command of Far East Air Forces. This tactical headquarters took command over the 19th Group at Okinawa on 13 July and over SAC's 22nd and 92nd Bombardment Groups, which on that day delivered their first attacks on North Korean targets.

Four days elapsed from the alerting of General O'Donnell and his staff at March Air Force Base, California, to their going into action as Bomber Command Headquarters in Japan. Eight days elapsed from the warning order to the 22nd Group at March AFB and to the 92nd Group at Fairchild AFB, Washington, until both these groups struck the key marshalling yards

The Korean air war bridged the twilight days of the piston-engined combat aircraft and the strenuous youth of the jet age. When the grand old lady of the Second World War, the B-29, was pitted against the sleek MIG-15, gloomy predictors foresaw a dire fate in store for the medium bomber. Yet, as Major General John B. Montgomery pointed out in a recent speech, the B-29's operated successfully throughout the Korean War. Only 26 days in three years failed to see Superforts droning through Korean skies. The battle area was small, General Montgomery pointed out, only about the size of the Texas Panhandle. MIGs outnumbered B-29's by about 10 to 1. Yet B-29 losses to fighter action numbered less than one per 1000 bomber sorties. At the request of the *Quarterly Review*, the staff of FEAF Bomber Command, under the direction of the Commander, has prepared the accompanying resumé of B-29 deployment, tactics, and achievements in the Korean War.



Eight days after the warning order first alerted the 22nd and 92nd Bomb Groups in the United States, B-29's from these groups attacked the marshalling yards at Wonsan. Key to Korea's east coast rail network, the Wonsan marshalling yards were 30 tracks wide and included important repair shops and a large engine roundhouse.

at Wonsan. Incidentally these two groups were low-priority SAC groups which only recently had attained acceptable combat-readiness standards. Never in history had such a deployment been effected so quickly. Moreover these groups came into action prepared for sustained combat operations. This was the dramatic payoff of all the planning and training, the movement exercises, the flyaway kits, and the ceaseless emphasis on mobility.

Bomber Command's Order of Battle was rounded out during July when two additional SAC B-29 groups, the 98th from Fairchild AFB and the 307th from MacDill AFB, Florida, moved to the Far East and entered combat only seven days after receipt of warning orders in the ZI. SAC also provided a separate strategic reconnaissance squadron, the 31st, for necessary reconnaissance support to Bomber Command's Korean operations. The 92nd and 98th Groups, together with the 31st Reconnaissance Squadron, operated from a Japanese base while the 19th, 22nd, and 307th Groups took station at Okinawa. The bases were approximately equidistant from the target areas in Korea.

PHASE ONE: DAYLIGHT OPERATIONS

FEAF Bomber Command came into being prepared to execute the Joint Chiefs of Staff Target Attack Plan for North Korea. This plan involved the neutralization of some 18 strategic targets previously selected and approved previously by the JCS, the Air Staff, Far East Command, and FEAF. Mass daylight attacks were to be aimed toward complete and systematic destruction of individual targets rather than schematic, serialized attacks against entire industrial systems. This concept was designed to ensure immediate destruction of the North Korean war potential in sequence of priority.

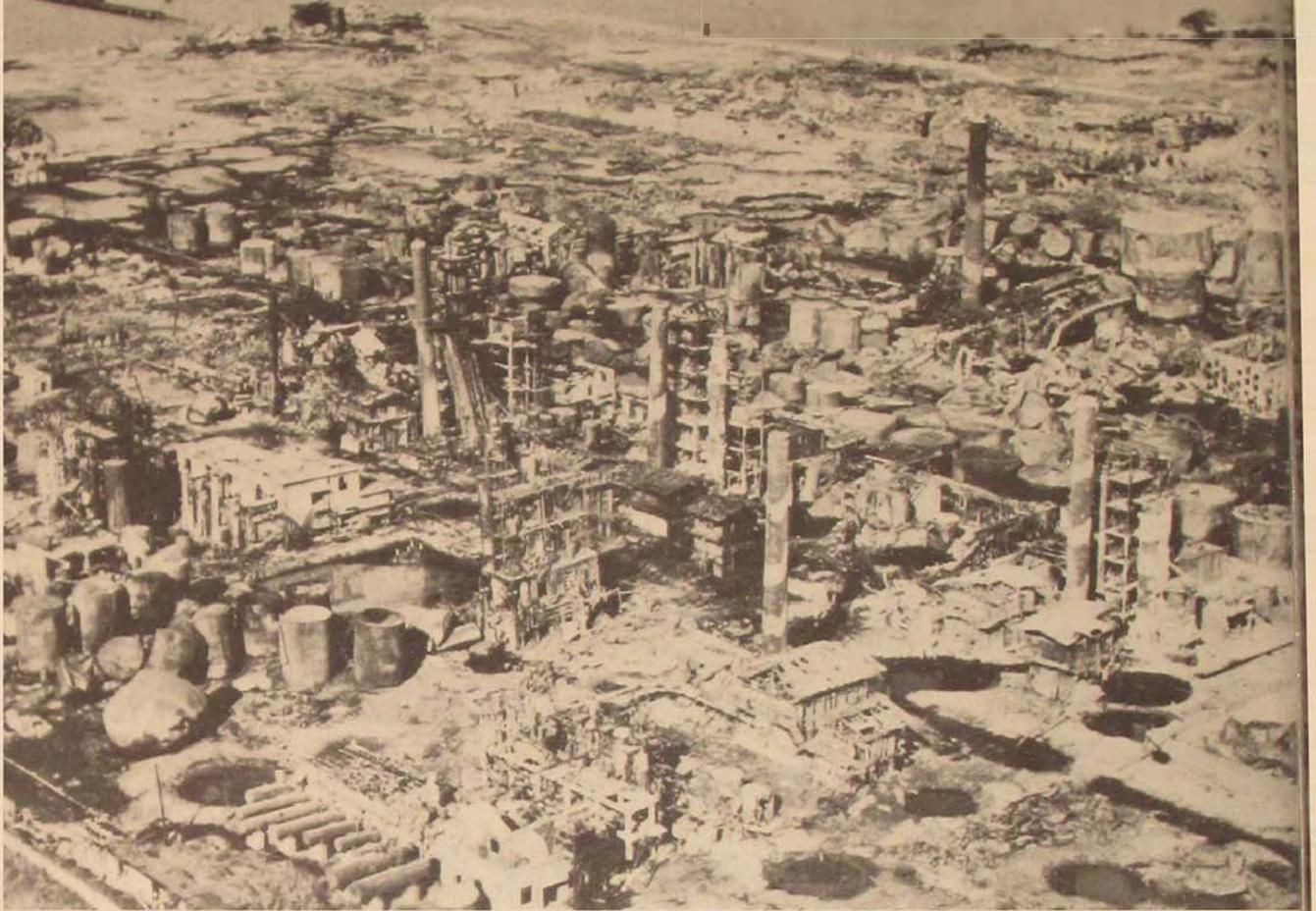
Direct Support Operations

But the ground situation was so desperate that it took first priority. GHQ diverted the Bomber Command B-29 forces from the strategic mission to direct support of the ground forces. Every imaginable tactical target—trucks, tanks, troop bivouacs, arsenals, supply dumps—was assigned to B-29 groups for attack and destruction. Little air opposition or flak worthy of the name was encountered during this initial period, although adverse weather conditions generally prevailed.

This tactical employment of the B-29, together with other tactical missions subsequently assigned, has been the subject of much debate and argument since 1950. At that time B-29's were the only aircraft available to furnish the direct, sustained, heavy support essential to our front-line ground forces. The success with which the B-29 met all these extraordinary requirements reflects high distinction on the aircraft, its makers, and the gallant crews who manned it. These were probably the last combat missions of the B-29, and history should take note that a great aircraft passed honorably—even brilliantly—from the combat rolls of the Air Force.

A month of these direct support operations found the ground situation sufficiently stabilized to permit Bomber Command to revert to its primary, strategic mission. The 18 JCS-chosen strategic targets began to feel the lash of the B-29's: 47 mediums hit the Chosen Nitrogen Explosive Plant at Konan; 39 planes attacked the Bogun Chemical Plant. Similar attacks were directed against the Pyongyang arsenal and marshalling yards, the Haeju ammo storage area, and the Chosen Oil Refinery at Wonsan on the east coast. Targets such as these constituted the heart of the North Korean war potential and week by week more and more of them were being crippled or destroyed. Bomber Command Superforts ran special leaflet drops, warning the civilian population to evacuate the areas scheduled for attack. Enemy air opposition was non-existent at this point.

In mid-August Bomber Command again held its strategic campaign in abeyance in order to mount a massive close-support mission. The Eighth Army, girding itself against imminent attack by 40,000 enemy troops northwest of Waegwan, requested maximum air assistance. Ninety-eight B-29's swept against the enemy front over a 24-square-mile area, dropping capacity loads of 500 pounders in a saturation "carpet" bombardment. No concrete evaluation of this spectacular assault was possible at the time, other than the significant fact that the enemy offensive was not launched. Bomber Command declined to speculate on effects which could not be confirmed factually,



The reduction of the 18 strategic targets listed by the Joint Chiefs of Staff was quickly accomplished by FEAF Bomber Command. In spite of periodic diversion of the B-29's to close support of the hard-pressed U.N. ground forces, the medium bomber had largely eliminated these strategic targets by the end of summer 1950. One of them was the Wonsan Petroleum Refinery, the only important POL refinery in Korea. Its annual capacity in 1945 was known to have been 1,650,000 barrels of crude oil, 4300 barrels of iso-octane, and 412,500 barrels from its cracking units. This oblique dicing shot shows the refinery 95 per cent destroyed or severely damaged, following three attacks in August by 39 Superforts armed with 500 and 1000-lb. bombs.

although Army division commanders were generous in their appraisal of the probable damage to the enemy. There can be little doubt that air interdiction and close-support were major contributions to the preservation of the Pusan perimeter during the perilous days.

Other Tactical Experiments

It was during this same period that the Superforts, flying singly, dropped flares for Fifth Air Force B-26's executing night-intruder attacks—another successful demonstration of B-29 versatility. During one such illuminated attack the B-26's destroyed a North Korean ammunition train and severely damaged two others. It is interesting to note, looking back on this era, the way in which the tactical possibilities of the B-29 were exploited so fully, once the decision for tactical employment had been made.

Not every experiment was an unqualified success, of course. There was the Razon bomb experimentation against bridge targets. This 1000-pound bomb

with special radio receiver in its tail could be remotely controlled by the bombardier during its fall, including changes in range and deflection. Razon had been used extensively in Europe during the closing months of the war, and postwar test had developed further the technique to some extent. Our Korean experiments were merely that. At first results were not encouraging, principally because of faulty bombs which had lain in overseas storage since 1945 and because of the lack of Razon training among our crews.

The targets were a real challenge—bridges only eight feet wide and running 500 feet or more in length. Notwithstanding the initial obstacles the Superforts were rendering a good account of themselves with Razon by September, with results from good to satisfactory and circles of error probability as low as 225 feet.

Meanwhile B-26's employing Razon at far lower altitudes were doing much better. B-26 hit expectancy from the 2000-12,000 foot altitude bracket was double that of the B-29's operating from 10,000-14,000 feet, notwithstanding the intense automatic weapons fire sometimes encountered at the lower altitudes. Several B-29's experimenting at lower levels scored CEP's averaging 150 feet. Razon, although reasonably effective, could not well be rated as a highly successful tactic for the B-29, as compared with results achieved by lighter, faster tactical bombers.

Limited experimentation was performed later with Tarzon bomb, a 12,000-pounder equipped with electronically controlled tail surfaces which permitted limited control of azimuth and elevation after release from the aircraft. Initial results were disappointing, although the final series of drops achieved a circular error average (CEA) of 273 feet. The one really successful attack was on the railroad bridge at Oesichondong, where two spans were destroyed. The experiment was phased out when Bomber Command's switch to night operations precluded visual control of bombs to target. Also some targets were heavily fortified by antiaircraft guns and as such presented undue risk to aircraft.

End of a Target System

Throughout the remainder of August and September, the principal effort of Bomber Command continued to be the strategic destruction of North Korea's warmaking potential. On August 28 a radar-bombing attack on the Japan High Frequency Industry Plant at Songjin achieved 95 per cent target destruction from a strike force of 47 B-29's. The ground support or tactical effort was not neglected during this critical period of ground-force operations. Each day 24 to 36 sorties were delivered against enemy troop concentrations, traffic arteries, and communication centers in support of our vastly out-numbered troops and in preparation for our counterattack to the north.

Notwithstanding this diversion from the strategic bombing offensive, all 18 strategic targets had been scratched by 25 September, shortly after the amphibious end-run to Inchon by the U.N. armies. Bomber Command had dropped thirty thousand tons of bombs in nearly 4000 sorties. Only four B-29's were lost in the process, three of them to enemy fighters. The Strategic Target Attack Plan had proved sound. The North Korean internal potential was devastated, and logistical support from outside Korea did not seem likely to appear in important quantities. Thus ended the Korean War—or so it was thought.

By 24 October 1950 Bomber Command B-29's had to stand down completely for lack of suitable targets south of the Yalu River. The 22nd and 92nd Bombardment Groups packed up and returned to their home bases in the ZI, carrying with them the commendations of General of Army MacArthur: "When strategic targets were no longer available, I was impressed with the demonstration of the versatile bomber crews and their weapons employed on missions of close support to the ground forces—missions not normally assigned to medium bombers. These missions stemmed enemy attacks upon our troops and made possible a rapid advance against stubborn enemy resistance." Bomber Command Headquarters busied itself with preparing to return other combat units to the ZI and with its own de-activation.

The New War

The active intervention and invasion of Korea by the Chinese Communists forces altered these plans drastically. As General O'Donnell reported at the time, "The arrogant pronouncements of the Communist leaders and the magnitude of their aggression reveal, beyond a shadow of a doubt, that their intervention has been long planned. As to their final objective, it is anyone's guess . . . perhaps even the occupation of Japan, itself. The U.N. decision to restrict our operations to areas south of the Yalu has obviously given the enemy an inordinate advantage which will be almost impossible to overcome. We are fighting distinctly under wraps."

Bomber Command was back in business with a vengeance. Superforts struck at Kanggye, Nanam, and Chongjin on 1 November, attacking warehouse areas, marshalling yards, highway and military bridges, and key military centers located in these cities. These missions were followed by the mass daylight strike of 79 B-29's against Sinuiju, a principal enemy communication and supply center near the mouth of the Yalu and only five miles from the great Communist air base complex at Antung, Manchuria. Half of the effort was devoted to incendiary attacks against such military supply and communication centers as Sonchon, Pukchin, Mansi, and Chosan, with the heaviest single attack against Hoeryong, where post-strike photography showed that more than 32,000 individual fire bombs destroyed ninety per cent of the target area.

The foreign Communist contribution to North Korea now became menacingly apparent. Enemy defenses of primary target areas began to develop rapidly. Substantial volumes of anti-aircraft fire were encountered at such targets at Pyongyang, Sinuiju, and Uiju. Eight B-29's were damaged by anti-aircraft fire in November. Day by day the missions encountered increasing fighter attacks from hostile interceptors based across the Yalu in Manchurian territory.

Within the next two months more than 150 heavy guns, partly radar-controlled and mobile, and with effective ranges up to 25,000 feet came into action at the more important North Korean target sites. The enemy fighter potential increased even more abruptly. Some 640 jet fighters took up station in the Northeast Military District, adjacent to Bomber Command's primary targets. Enemy jets could reach most locations north of the bomb line in from 12 to 35 minutes. Three hundred and fifty of these jets were based in the Antung complex of airfields, with the balance stationed at bases in the Mukden area.

In addition to his jets the enemy had approximately 160 conventional type fighters—principally the LA-11 and the YAK-9P types—based in the Mukden region. One B-29 was lost to concentrated fighter attack over North Korea on 10 November in the early phase of the enemy air build-up.

X Corps had been probing north to the Yalu in the reservoir area. By December the Chinese Communist intervention had put tremendous pressure on the 1st Marine Division and the 7th Infantry Division at Hagaru-ri and Koto-ri. Bomber Command Superforts unloaded 96 tons of bombs against military installations in three of the enemy's key towns in this sector—Yudam-ni, Changjin, and Sachang-ni.

Interdiction Campaign No. 4

From the beginning of the war Far East Air Forces devoted much effort to interdiction. In early December 1950 FEAF published "Interdiction Campaign No. 4," specifying a total of 173 targets in 11 zones of enemy-held Korea. This marked an opportunity to establish a comprehensive, advance-planned campaign of attack; earlier tactical operations of Bomber Command had been on a need basis in accord with the rapid shifts and changes of the battle situation. As the first phase of Bomber Command participation in the campaign, 48 mediums from Okinawa and Japan struck eight such targets simultaneously with 354 tons of bombs. Targets ranged from the west to the east coast and from the Yalu River south to the battlefield. Troop concentrations received some ten per cent of the December effort.

Christmas Day 1950 was just another combat day for Bomber Command air and ground crews in their 24-hour-a-day tactical role. The great Sariwon training area and assembly point was saturated with bombs, and the explosions and fires could be seen for miles by the homeward-bound Superfort crews. The B-29's were being employed wholly in unit-increment formation—groups, squadrons, elements in trail, passing over the target in compression and at varied intervals. The New Year was observed with a 68-plane incendiary strike against military installations in the capital city of Pyongyang.

By early February the U.N. position in Korea generally was considered very satisfactory. The ground offensive kicked off in late January and rolled northward against light resistance along the entire Eighth Army front. Fifth Air Force and Bomber Command aircraft ranged over the entire zone of operations, with the B-29's concentrating on the more vital supply centers and major lines of communication. Highway and railroad bridges were high on the target priority list, while marshalling yards, third-priority interdiction targets, received thirty per cent of Bomber Command tonnage. Enemy air opposition continued to develop.

Daylight Opposition Increases

Four B-29's assigned to attack Sunchon on 25 February were assailed by eight MIG-15's and were under continuous attack for six minutes. The mediums escaped damage and destroyed one MIG. Four days later, F-80's escorting a B-29 mission were forced to break off escort only minutes before the target because of fuel shortage. Just after bombs-away, the bomber formation was attacked by nine MIG-15's in a running fight which lasted for 23 minutes. Two Superforts received major damage while shooting down one

MIG and damaging two. Such attacks usually were made by from five to twelve fighters.

A "big" day in the annuals of FEAF Bomber Command came on 12 April, when 48 Superforts from the 19th, 98th, and 307th Wings went after the massive railroad bridge linking the Korean transportation center of Sinuiju to Antung, Manchuria. Bitter enemy opposition was expected, and bitter enemy reaction was encountered. Between 72 and 84 enemy jet fighters swept against the strike force. Three B-29's were lost and seven damaged in a sharp air battle which saw the caliber .50 guns of the Superforts destroy nine MIGs, probably destroy six others, and damage four. The bridge was knocked out.

Ground-Directed Bomb Drops

Bomber Command, committed to tactical operations, had to develop a precision bombing capability for tactical targets close to the bomb line. Razon bombing was no longer being attempted; emphasis was now on a system of ground-directed radar bomb drops. Such bombing is unaffected by darkness or weather, and a single B-29 could be sent against numerous targets on a single mission, dividing among them its load of 500-pound general-purpose bombs with variable delay fuses.

Enemy positions as close as 1000 feet to friendly forces were attacked by this means. Bomber Command operations with the ground-directed system began in late February 1951 and continued along the front line, with varying effect, until the signing of the truce in July 1953. B-26's also engaged in this tactic under similar procedures.

Sorties of this type were usually limited to two or three per night, but occasionally there were as many as 18. The early effort was against troop concentrations but later attacks shifted to supply installations and gun positions beyond the range of artillery. It is extraordinarily difficult, if not impossible, to ascertain exactly what this type of attack achieves. In the first place the targets are usually poorly defined in pre-strike photography. Post-strike examination also tells little or nothing because of the obliteration effected by friendly forces and artillery immediately following the bombardment. The identifiable bomb craters, in such circumstances, are generally insufficient to permit accurate estimate of the mean point of impact.

The difficulty of precisely assessing damage by no means depreciates the effectiveness of this close-support technique. Front-line commanders generally were most appreciative of its effect during the enemy spring offensive of 1951. One such B-29 front-line support mission is known to have knocked out two regiments and one battalion of enemy troops. Such attacks are most effective, of course, when fitted into an over-all plan of strategic and tactical operations which brings the total air effort upon the heads of the enemy on a round-the-clock basis.

Night after night during the enemy spring offensive Bomber Command B-29's flew close-support missions against the enemy troops surging down from the north. Special 500-pound fragmentation air-bursting bombs were used, with proximity fuses set to explode 50 to 100 feet over the enemy. Accuracy was practically equivalent to daylight bombardment.

The 2nd Infantry Division Commander, Major General Clark L. Ruffner,

commenting on night precision bombing by the B-29's on May 20-21, radioed the FEAF Commander:

Tremendous damage inflicted by your bombs has reduced considerable pressure by the enemy against my command. Precision of bombardiers in destroying morale of entire enemy units assembling for attack within 400 yards of front lines utterly amazing. Captured U.S. soldier escaped during your attack on Sinchon near midnight and reported greater part of enemy battalion moving in to attack Ninth Infantry was destroyed and remaining enemy fled in panic-stricken confusion.

Bomber Command also continued its airfield neutralization attacks, concentrating on the ten major enemy complexes. These attacks were important in denying the enemy tactical air support for his ground offensive. Because of the Communist ability to fill bomb craters, clear away destroyed buildings and rubble, and to return airfields to serviceability was little short of fantastic, these attacks had to be repeated again and again. Concrete and sod strips suitable for both jet and conventional fighters were only minutes away from our own front lines and, like the enemy rail lines and bridges, were restored to operation time after time when we had blasted them into apparent shambles. All sizes of bombs and types of fuse settings were used against these strips and revetments, with an estimated result of 95 per cent denial of them to the Communist air force.

One of the continuing jobs assigned to Bomber Command was to keep the enemy airfields in North Korea out of commission. Since the Communists constantly had hordes of laborers repairing airfield damage, the neutralization programs called for systematic reconnaissance and repeat raids just as previous damage had almost been repaired. This photograph shows a B-29 strike on Yonpo airfield near Hungnam drilling a new set of holes in the airfield's laboriously repaired runway.



Shoran Bombing

Ground-directed bombing, for all of its successes in close-support attacks, was no answer to the need for attacks in the rear areas far removed from ground controllers. The increasing trend toward night operations, the lack of suitable radar targets, and the high percentage of overcast or broken weather underscored the critical need for a precision bombing system which would overcome these obstacles.

Shoran (Short-Range Navigation) proved to be the answer. This technique involves a system of electronic triangulation wherein pairs of ground stations are interrogated automatically and aircraft positions are computed constantly along arcs.

Some of the essential equipment was already in the area. By the late spring 1951 the ground situation had become relatively static, and the bomb line was fairly stationary. Multiple runs could now be made on less-defended targets. The principal Shoran limitations were in equipment range and in number of approaches to a given target.

Starting almost from scratch, but with valuable help from the Combat Crew Training School at Randolph AFB and SAC's training wing at Forbes AFB, Kansas, Shoran training was given ground and air crews as quickly as equipment could be installed. Shoran installations began in June 1951, although lack of equipment, training operators, and maintenance personnel in the theater delayed a 100-per-cent Shoran capability to a full year later. Shoran began to make itself felt immediately, however, with an attack against the important bridge at Sariwon scoring "excellent" results. The 98th Wing was the first to be equipped, followed by the 19th and the 307th Wings. By November, when night operations became standard, enough aircraft and crews were equipped and trained so that Shoran became Bomber Command's primary method of bombing.

Mission planning for Shoran bombing was quite complex because of the limited target approaches and the critical requirement for the most advantageous "cut" on the target. Each target had to be located precisely. For a time planners used the maps made by Japanese engineers during their 28-year occupation of Korea. Later multiplexing, a system of obtaining geodetic coordinates from aerial maps, replaced the Japanese maps. The accuracy of multiplexing was a principal factor in the steady improvement in results gained with Shoran. Bomber Command established target computation requirements, teletyped this to the wings scheduled for a particular mission, and exercised minute control to ensure against all possible errata in target plotting.

A high degree of mission effectiveness was soon apparent. There can be no doubt of the capability of Shoran-equipped B-29's to destroy a target in good weather or bad, in daylight or in darkness. Circular error decreased to 500 feet and less, as seasoned combat crews refined their techniques and the operations staff eliminated the various unknowns in the planning factors which had plagued the early missions. The B-29's used Shoran to interdict the Pyongyang area when U.N. forces began their offensive against the capital city. So thorough and precise was the destruction of railroad yards, rail lines, roads, supply dumps, and bridges in the enemy's rear communication zone that the U.N. ground forces found Pyongyang a deserted city when they entered.



No matter what their length, the narrow 8-foot width of the Korean bridges made them a pinpoint target for B-29's operating at altitudes of 10,000 to 14,000 feet. But the bridges had to be knocked out, and Bomber Command's accuracy was equal to the task. In the early summer of 1951 about one half of the B-29 effort was directed at rail and highway bridges. This photograph shows a perfect strike on the 17-span steel railroad bridge across the Taedong River. A main link in the Communists' west coast transportation net, the bridge lost two spans in this attack.

The Truce Talks Begin

During the early summer of 1951 the daily sortie rate was reduced from 24 to 12, with the 12 reserved aircraft undergoing intensive training to increase bombing effectiveness. Approximately one half of the combat effort was being placed against rail and highway bridges with substantial emphasis on supply centers and troop areas. The Reds continued their troop and logistic build-up, notwithstanding the truce discussions which began in early July, so the sortie rate was stepped up to 18 per day as a counter to the Red build-up and to bring added pressure on the Communist negotiators at Panmunjon.

Aggressive enemy air opposition began to be felt further south than ever before. Some 30 to 40 MIG-15's were usually sent up to engage the Superforts during the Pyongyang interdiction campaign. More intense, accurate flak, indicative of gun-laying radar, was encountered by B-29's at altitudes well

in excess of 20,000 feet during night operations. No aircraft were lost during this period although 13 were damaged.

Bomber Command changed the pace again on August 14 and sent 68 B-29's in another massive strike against the supply center near Pyongyang. On 25 August, 35 mediums were dispatched against the marshalling yards and docks at Rashin for the most successful raid of the year. More than 7000 feet of railyards, an 18-track storage area, repair shops, engine houses, and warehouses were blasted out of service in this east coast rail center only 17 miles from the Soviet border. Considerable antiaircraft fire was experienced over this target which had been untouched for more than a year.

The Rashin strike was the kick-off for FEAF's Rail Interdiction Program. Communist lines of communication were in badly battered condition but the Communist horde of laborers worked feverishly and effectively to repair damaged or destroyed bridges, to construct by-passes at key-points, and to maintain clear passageway through smashed marshalling yards. B-29's countered this desperate repair effort by repeated attacks on vital points everywhere between the bomb line and the Yalu. The campaign against the bridges was highly successful, though repeated effort was often necessary. Two airfields were prime targets, and were subjected to 21 major attacks because of the Red's patch-up capability. Troops and supply centers were also hit, but after the destruction of the strategic target system 70 per cent of Bomber Command operations had been against interdiction targets.

PHASE TWO: NIGHT OPERATIONS

THE enemy desperately needed the new airfields south of the Yalu to advance his air attack closer to the battleline. Therefore he was not disposed to take the B-29 destruction of his airfields passively. The enemy air effort was tripled in October 1951. As many as 200 jet fighters swept south across the Yalu to oppose daylight B-29 formations in a single battle. Casualties were high: 55 crew members were killed or listed as missing and 12 were injured as five B-29's were shot down and eight other mediums received major battle damage—all in engagements by groups of 50 to 70 cannon-equipped MIGs defending Taechon and Namsi airfields. Between July and the end of the fourth week in October 1951, eleven of the swept-wing MIGs were destroyed in air-to-air engagements and four probables were claimed.

Daylight operations continued in spite of the increase in enemy fighter opposition, and no mission was deterred from its target by the bitter defense. But strong screens of fighter escorts were required, and Bomber Command questioned the value of such heavily escorted daylight missions against relatively unimportant targets when primary targets could all be attacked readily and effectively through night Shoran operations.

Brigadier General Joe W. Kelly, then commanding Bomber Command, reported his decision to General LeMay: "To employ no more B-29 formations on daylight missions until more important targets are developed. Main reason being that better utilization of the [friendly] fighters dictates that they be used for other than escort missions. Enemy airfields and other targets are now effectively attacked by night Shoran operations."

Full-scale night operations showed no loss in effectiveness, since both ground-directed drops and Shoran operations were unimpaired by either

darkness or weather. Primary emphasis remained on the airfield systems, including Saamchan and Uiju, at the same time working over the key bridges in the enemy's transportation network. Accuracy continued to increase during the winter-spring campaign as Bomber Command crews became more proficient in their specialized techniques.

Operations had become highly systematized, with target selection, areas of responsibility, and operations orders coordinated among Bomber Command, Fifth Air Force, Marine Air Wing One, and the Navy carrier forces. The latter had prime responsibility for east coast tactical targets. Night propaganda missions were flown to the more populated areas, each B-29 carrying almost 1,000,000 warning leaflets for dispersal from light metal casings which exploded several thousand feet above the target area.

Bridge Bombing

The extensive bridge bombing campaign of Spring 1952 involved 85 separate attacks designed to reduce the enemy's resupply and troop mobility, most of which relied on rail transportation. Little could be done to stop the thousands of North Korean and Chinese peasants carrying great burdens on "A" frames lashed to their backs.

Forty-six Superforts hit a double by-pass bridge at Pyongyang on 25 March 1952, severing it in nine places. Bomber Command's 100,000th ton of explosives fell squarely on the rail bridge at Chonju three nights later. Adverse weather did not spare two major rail lines running south to Sinanju.

Night bombing of the typical rail or road bridge, perhaps eight feet wide and from 3000 to 5000 feet long, posed a real problem, even with minimum intervalometer settings. Strategic bombing manual data as to ballistics and hit factors were not applicable to this problem. Shoran technique had to be developed as operations progressed. Numerous factors, including minimum force requirement, altitude, fuse settings, and bomb weights entered into the problem. Even so, and despite the low probability factors, 143 hits were confirmed in these attacks and 66 spans were dropped from 10 bridges during May 1952. No losses were suffered by the Superforts. On the other hand, this was clearly a type of target best suited to low-level or dive attack by light bombers.

Even while the bridge-busting campaign was on, Bomber Command did not neglect the airfield neutralization campaign, delivering almost 400 effective sorties against 18 of the Communist airfields south of the Yalu.

PHASE THREE: DEVELOPMENT OF NIGHT DEFENSIVE TACTICS

THE enemy had two basic defensive weapons available: fighter aircraft and anti-aircraft weapons. Experience proved the fighter to be the more effective. Either or both could be employed in conjunction with radar or searchlights to increase their effectiveness during darkness. Radar control also contributed to their effectiveness in adverse weather.

Night operations in no way affected Bomber Command's bombing accuracy. In fact some distinct advantages accrued from the darkness, even though the enemy's defensive capability was not nullified. The MIG fighter posed the

biggest threat, even in the bitterly defended Sinuiju-Uiju sector, where accuracy and intensity of flak varied in direct proportion to illumination of bomber aircraft afforded by enemy ground batteries. (The 20mm and the 37mm explosive shells are effective. A relatively few hits can cause complete loss of a bomber aircraft.)

Searchlights

Analysis of attacks experienced in June 1952 disclosed a close coordination between MIGs and enemy searchlights. Searchlights posed little problem on night missions where an undercast was present, although the B-29's might be outlined by the moon against the top of the weather. A large percentage of the enemy's 200-plus searchlights were radar-controlled and could "lock on" aircraft in the bomber stream for periods of several minutes, setting up the bomber stream for fighters vectored to the vicinity by GCI. Two Superforts were lost and one damaged by such tactics on 10 June 1952.

Searchlight effectiveness decreased somewhat at the higher altitudes, and B-26's sent in ahead of the attack were moderately successful in knocking out searchlights. By far the most effective defense against non-radar searchlights proved to be the use of jet black paint on the complete underside and tail of the B-29's. Experiments with painted and unpainted aircraft definitely confirmed the value of this measure, and no measurable airspeed loss resulted from the camouflage.

Contrails

Contrails usually formed at altitudes above 20,000 feet during the winter months. These betrayed Bomber Command formations to Communist searchlights, antiaircraft guns, and fighters. Sometimes stringing out for miles behind each Superfort, they were like arrows pointing to their source. Countermeasures consisted of exacting weather analysis and forecasts designating altitude levels where contrails were not expected to form. Emergency bombing altitudes were assigned aircraft that suddenly encountered contrail conditions.

Limited Area of Operation

The small physical dimensions of the enemy homeland—160 miles wide and 250 miles from the Yalu to the bomb line—meant that enemy jet fighters had only a few minutes flight to get to most target locations. Within this limited area there was only a handful of possible targets, so that it was no intellectual challenge to the enemy to guess the probable bomb drops. Accordingly Bomber Command diversified its operations as much as possible, guarding against establishing any predictable pattern on repetitions of routes, feints, and attack times.

Aircraft Compression . . . Use of Multiple Approaches

Compression over the target was felt to be the outstanding tactic Bomber Command could employ for reducing the over-all risk. Each bomber wing strove constantly for maximum compression from the initial point (IP) until the breakaway at the release point or over the target itself. This program achieved significant success. B-29's that had taken off at 30-second

or one-minute intervals 800 miles away and were navigating individually, fanned into the IP at precise intervals of one minute—sometimes less—with only a few hundred feet of vertical separation and often on multiple, intersecting courses. The system had several advantages: it provided an element of surprise, minimized the time of exposure, and divided the enemy's defensive effort.

Bombing Altitudes

Antiaircraft fire encountered at altitudes above 18,000 feet was relatively inaccurate, although largely of heavy caliber. Bomber Command's usual bombing altitudes of 18,000 to 28,000 feet gave increased bombing stability and a very low loss rate to antiaircraft artillery. Higher altitudes were flown over the more sensitive targets, requiring careful study of the upper-air jet stream during winter months.

Fighter Escort

Escort of the World War II type utilized over Europe was not considered necessary, since the Communist Air Force fighters rarely ventured out over the Japan Sea or south of the 38th parallel. Friendly fighters of the Fifth Air Force (USAF F-94's and Marine F-3D's intercept type) provided escort from a point near the IP through the target area, including coverage and withdrawal screening. A "barrier cap" of fighters patrolling high between the target and the Communist air bases north of the Yalu proved very effective and scored some night kills. The presence of blips on the enemy's radar screens caused by friendly fighters, plus the ability of the Fifth Air Force aircraft to stalk the MIG with airborne intercept equipment, served as a substantial deterrent to enemy air attack. A considerable reduction in the number of enemy firing passes was reported after these procedures became SOP.

Reconnaissance

The 91st Strategic Reconnaissance Squadron (redesignated from the 31st) had been under the operational control of Bomber Command since the beginning of hostilities. The operations of this separate squadron combined tactical, strategic, and special reconnaissance. The squadron faced a myriad assortment of logistic, organizational, and operational problems. More than twice the size of an ordinary reconnaissance squadron, the 91st operated three types of aircraft, the RB-29, the RB-50, and the RB-45. It tackled such diverse missions and problems as mapping, bomb damage assessment, photography, target illumination, Shoran computations, and psychological warfare leaflet drops. Bomber Command effectiveness was greatly enhanced by the essential reconnaissance support rendered by this squadron.

Continuing the Pressure

Bomber Command entered the third year of the war with a rare treat: a strategic target was available again. This was the Oriental Light Metals Company at Yangsi on the Yalu River. Sixty-three B-29's penetrated to the target and returned, leaving 70 per cent of the factories in utter ruin. During the same month of July, 54 B-29's visited Pyongyang, demolishing 590 build-

ings and damaging 135 others in the military depot, vehicle storage, and industrial areas of the Red capital.

Tactics had been tested and developed so well that Bomber Command had standing procedures for practically every type of mission. The ordinary 500-pound high-explosive bomb was the most common weapon, with fuse setting varied to suit the mission. Occasionally loads of 4000-pound light-case explosives were delivered on front-line targets, partially for psychological effect. Semi-armor-piercing 2000-pound bombs were used in the 12 September mission against Suiho. The hydro-electric plant at Suiho dam, heavily damaged by fighter-bomber attacks, was again knocked out of production by this attack.

Night missions had become the normal technique but daylight missions were on wherever the target merited such treatment. Brigadier General Wiley D. Ganey led such a daylight attack against a troop and supply build-up on the east coast on 19 September. Thirty-three Superforts delivered a highly effective incendiary and high-explosive strike on this important target which was not amenable to night attack.

Throughout the winter of 1952 and spring of 1953, the mediums from Japan and Okinawa maintained a steady tempo of assault against Red supply centers across the length and breadth of North Korea. The truce talks dragged on at Panmunjon, even as the Reds mounted one limited offensive after the other in attempts to secure more advantageous boundaries in the cease-fire agreement. Meanwhile Bomber Command mediums participated in the five-day attack against the rail and road hub at Sinanju and mounted heavy strikes against the Communist front lines, particularly in the east-central sector. As many as 24 B-29's struck battleline positions almost simultaneously with antipersonnel fragmentation clusters mixed with quarter-ton bombs. One operation in five consecutive nights delivered 970 tons of bombs on dug-in Communist troops and gun emplacements in the Kumhwa and Iron Triangle areas only 30 miles from the truce conference tents at Panmunjom.

The Final Campaign

In the late spring of 1953 Bomber Command renewed the emphasis on bridges and airfields. The tentative truce terms provided a 12-hour free period between the signing of the agreement and the time it was to become effective. This would give the Communists the chance to move large numbers of crated jet aircraft onto the ten major North Korean airfields during the period of grace. Bomber Command's objective was to interdict any such traffic and to keep the fields in such chaos that no aircraft could be flown in to them.

At least one and usually two of these ten airfields were scheduled for attack during each night of this systematic campaign during the final two months of the war. Bomber Command B-29's roared off night after night to keep the airfields neutralized, while photo reconnaissance kept tally of the destruction and of the enemy's fantastic repair efforts. Whenever reconnaissance showed that the time was ripe to inflict optimum damage to the reconstruction, Bomber Command returned again—and again—up to the very last day of the war, when Superforts smashed Saamcham and Taechon airfields for the last time.

Coasting out of North Korea at 1503 hours, 27 July 1953, just seven hours prior to the cease-fire deadline, an RB-29 of the 91st Strategic Reconnaissance Squadron completed its last photo-reconnaissance mission. FEAF photo-reconnaissance confirmed that all ten North Korean airfields assigned to Bomber Command were completely unserviceable at the truce hour.

In the 37 months of the Korean War, Bomber Command B-29's had blasted Korean targets with some 167,100 tons of bombs in more than 21,000 individual sorties. Bomber Command's losses were exceptionally light, with sixteen Superforts lost to enemy fighters, four to anti-aircraft fire, and fourteen to operational accidents. B-29 gunners had shot down 33 Communist fighters (16 MIGs), probably destroyed 17 (all MIGs), and damaged 11 (all MIGs). Bomber losses were little higher than those experienced by training units within the Zone of the Interior.

Conclusions

THIS was a strange air war which Bomber Command fought in Korea. Medium bombardment aircraft of the conventional type were in action against aggressive enemy jet fighters. Bomber Command fought with what it had, and what Bomber Command had was much better for the purpose than anyone had ever thought.

The versatility of the B-29 surprised everyone, including the enemy. Great credit must go to the combat crews, to those who trained them, and to the dynamic leadership which was unafraid to adapt old techniques and to develop new ones for this peculiar war.

The JCS Target Attack Plan was tremendously effective. When its 18 target complexes had been smashed, North Korea was a helpless shambles until the external Communist forces entered the conflict.

The SAC mobility concept was realized fully and dramatically, as was the war-practicality of the of the SAC Specialized Maintenance System. Bomber Command's sustained sortie rate from the very first day of combat stands as testimony to the validity of both concepts.

But while many subsidiary lessons were learned, in the main the Bomber Command experience in the Korean War seemed to re-emphasize the established tried-and-proven things that had been learned long before. Perhaps the greatest and most important conclusion to be drawn from the Korean air war is that quantity is still no match for quality, whether is in men or in machines.

Headquarters, FEAF Bomber Command (Provisional)

... Air Force Review

REBIRTH OF THE JAPANESE AVIATION INDUSTRY

Under USAF Guidance Nippon Prepares for Air Defense

COLONEL GALE E. SNELL

THE years immediately following World War II revealed a vast power vacuum in the Pacific. Japan, the greatest power and the only industrial nation in the Far East, had been shattered by the war and stripped of its remaining military strength by the terms of the surrender. Communism surged into the tremendous gap left by the collapse of the Japanese Empire and the weakening of the European colonial ties. The United States found itself in the unpleasant position of bolstering the Japanese economy at a cost of some \$250,000,000 a year and of providing the forces to defend Japan from foreign aggression. Under the terms of surrender this situation would have continued indefinitely.

The Korean War, a naked attempt by the Communists to grab a springboard for a move on Japan, accelerated U.S. efforts to put Japan on its economic and military feet. If Japanese industry and skilled manpower fell into Communist hands, all Asia might fall with it. One by one the restrictive bans on Japan's economy were lifted. Japanese industry became a contracting partner in logistic support of the Korean War. The Japanese Security Force was expanded into the nucleus of a modern army.

Of all resources for defense, Japan was most lacking in air power. And of all defense forces, Japan most urgently needed air forces to shield her home islands from the Chinese and Soviet air power that rimmed the other shore of the Sea of Japan from southern China through Vladivostok to Sakhalin on the north. The postwar Japanese constitution expressly forbade even the semblance of an air force. The once-powerful Japanese aircraft industry was producing household knickknacks. Even if the U.S. had been willing to adopt the expensive expedient of giving Japan an American-built air armada, it would have only partially solved the problem of Japan's air defense. There is no genuine air power without the industrial base to support and advance it. The Japanese aviation industry had to be rebuilt. Its past history showed that it could be rebuilt.

The story of Japanese aviation, from its beginning in 1916, had been one of continuous progress. A mammoth industry reached a peak of wartime production in 1944 when some 10,688 air frames and 40,090 aircraft engines of all types were produced. It is an industry that over the years has produced a total of some 70,579 aircraft.

This 1944 production peak suddenly toppled when Japanese aviation

plants became prime targets for the United States Army Air Forces' long-range, hard-hitting B-29's. It fell from its 10,688 production peak to zero with the Japanese surrender in 1945. So absolute was this zero production figure that even the making of model airplanes was prohibited.

Japanese heavy industry was ordered to shift to non-military production. Large holding companies were disbanded. The family controlling the vast Mitsubishi industrial empire was forced to sell its interests. All large industrial combines were broken up into numerous smaller companies.

For almost eight long years that part of Japan's vast industrial aviation capacity which survived Allied bombing and economic collapse after the war, has been producing motorcycles, three-wheeled trucks, refrigerators, stoves, motor-scooters, busses, and autos. They have also engaged in procurement contracts with the American Security Forces. (See Col. Hugh J. Mattia, "Air Force Procurement in Japan," *Air University Quarterly Review* VI, 3 (Fall, 1953), 123.)

Some of the companies were able to retain their skilled aeronautical engineers and machinists by placing them in their associated industries. They were the men upon whom Japan had to rely if she was ever to return to aircraft production. With the signing of the Peace Treaty, Japan once again became a sovereign nation. In July 1952 the Japanese Diet passed an aviation law to regulate and promote Japanese aviation under the provisions of the International Civil Aviation Pact. Firms are required to be licensed by the government in order to engage in aviation activities.

With this legal sanction, the dormant aviation industry came to life. Companies were organized and reorganized. Stock values soared and then crashed overnight for the less-solvent firms. Experimental Japanese aircraft plans were laid. The first problem was to catch up with the rapid strides made by world aviation in the years since 1945. In July 1945 the Japanese had been testing turbo-jet engines and even had one in experimental manufacture. The state of the jet art had come a long way since then.

The desire to get back into commercial competition on aircraft products was only a part of Japanese motivation. Both the Japanese and American governments recognized Japan's need to rearm in order to provide powerful and modern air defense against the time when United States forces would withdraw. Japan must be a strong, vital link in the defense chain of the free world in Asia.

With an earnest desire to get back into the air, leading Japanese aviation firms, in cooperation with the Japanese government, began to rebuild, repair, and revamp their facilities. Thousands of heavy machines had been salvaged from the bombed factories. These machines were brought out of storage and put into working order. The skilled technicians and engineers were called back from their motor scooter and sewing machine plant jobs.

With the aid of Far East Air Logistic Force training facilities, employees of private firms were trained in the latest American production and assembly line techniques and methods of aircraft maintenance and overhaul. In the fall of 1953 a number of employees of leading Japanese aircraft firms completed comprehensive training on the F-86 Sabrejet.

Such well known aviation names as Mitsubishi, Kawasaki, Kawanishi, Showa, and Nakajima re-emerged as the Mitsubishi Heavy Industries, Reorganized, Ltd.; Kawasaki Aircraft Co.; Shin Meiwa Industry Co., Ltd.; Showa Aircraft Company; and Fuji Heavy Industry, Ltd., respectively.

Mitsubishi Heavy Industries

IN December 1952 the Mitsubishi Heavy Industries, Reorganized, Ltd. began construction of a new 150,000 square-foot factory site adjacent to the Security Force's Komaki Air Base a few miles outside of Nagoya, Japan. The Air Force officials assisted in the arrangements of the shops within the facility. The result was a show place among Japanese industrial plants—excellent lighting, highly efficient supply and parts facilities, painted interiors conducive to high worker morale and consequent high production. Ground safety rules were laid down and enforced. Medical facilities, staffed by a doctor and three nurses, were made available for plant personnel. Workers were provided with a modern dining hall and plant store where everything from blankets and heating burners to tooth brushes could be purchased almost at cost.

Machine shops too were laid out carefully with plenty of working room. All these things are taken for granted by Americans, so it is hard to realize how revolutionary such a factory is in Japan. In less modern plants, ones not engaged in Air Force work, heavy-duty machine tools are crowded row upon row and lathe operators work almost back to back. Light may filter through from dingy windows some 20 feet away, but the main source of light is from an unshielded 60 or 75-watt bulb dangling from the ceiling. The Air Force contracting officer at the Mitsubishi plant, speaking of these conditions so prevalent in Japanese industry, said that at first the American operating methods and procedures were undertaken because they were required by the Air Force. Later the plant operators began to take pride in the new ways and to realize their value from a morale and production standpoint.

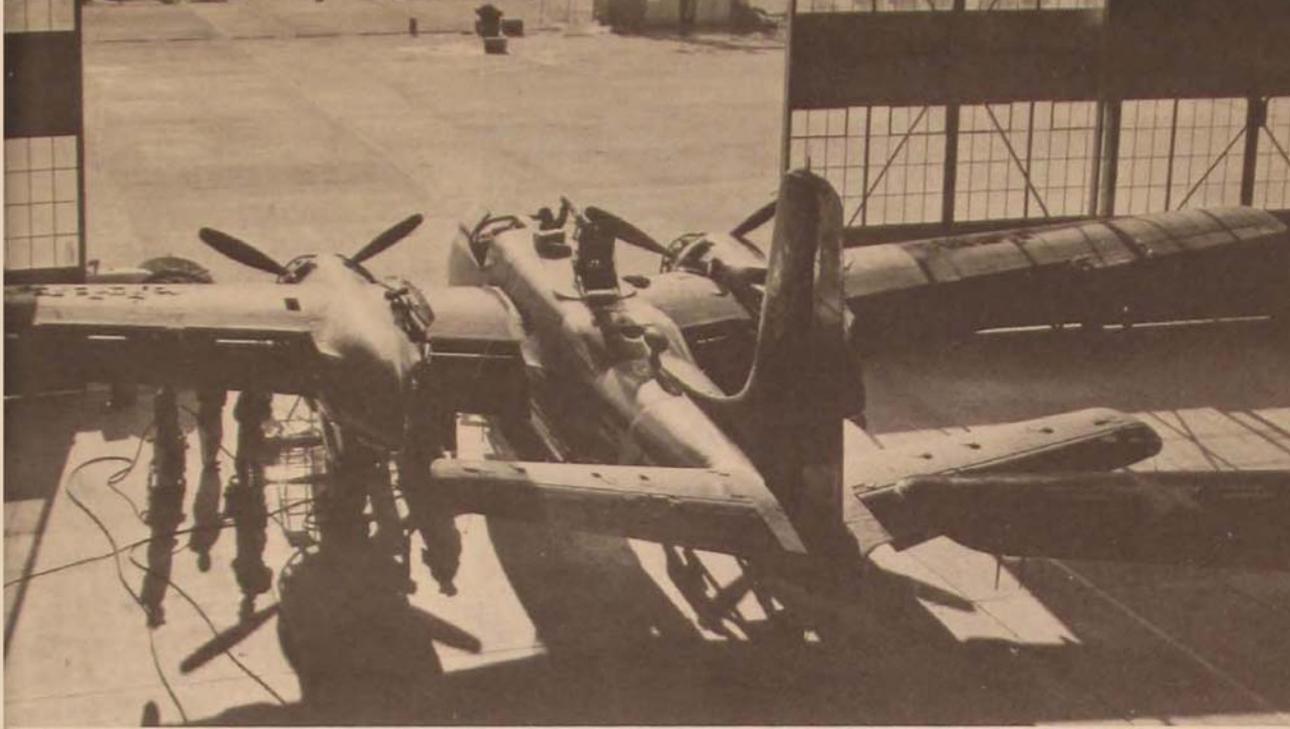
In June 1953 the firm began work under the terms of a contract with the Far East Air Logistic Force calling for overhaul and maintenance of B-26's and C-46's. During the first six months of the IRAN (Inspect, Repair as Necessary) program, 18 B-26's and 3 C-46's were completed.

The Mitsubishi Company purchased all of the equipment necessary for the contract with the exception of certain items peculiar to those types of aircraft, which were consequently loaned by the Air Force. In all Mitsubishi purchased more than \$100,000 worth of the latest testing equipment from American sources through normal trade channels.

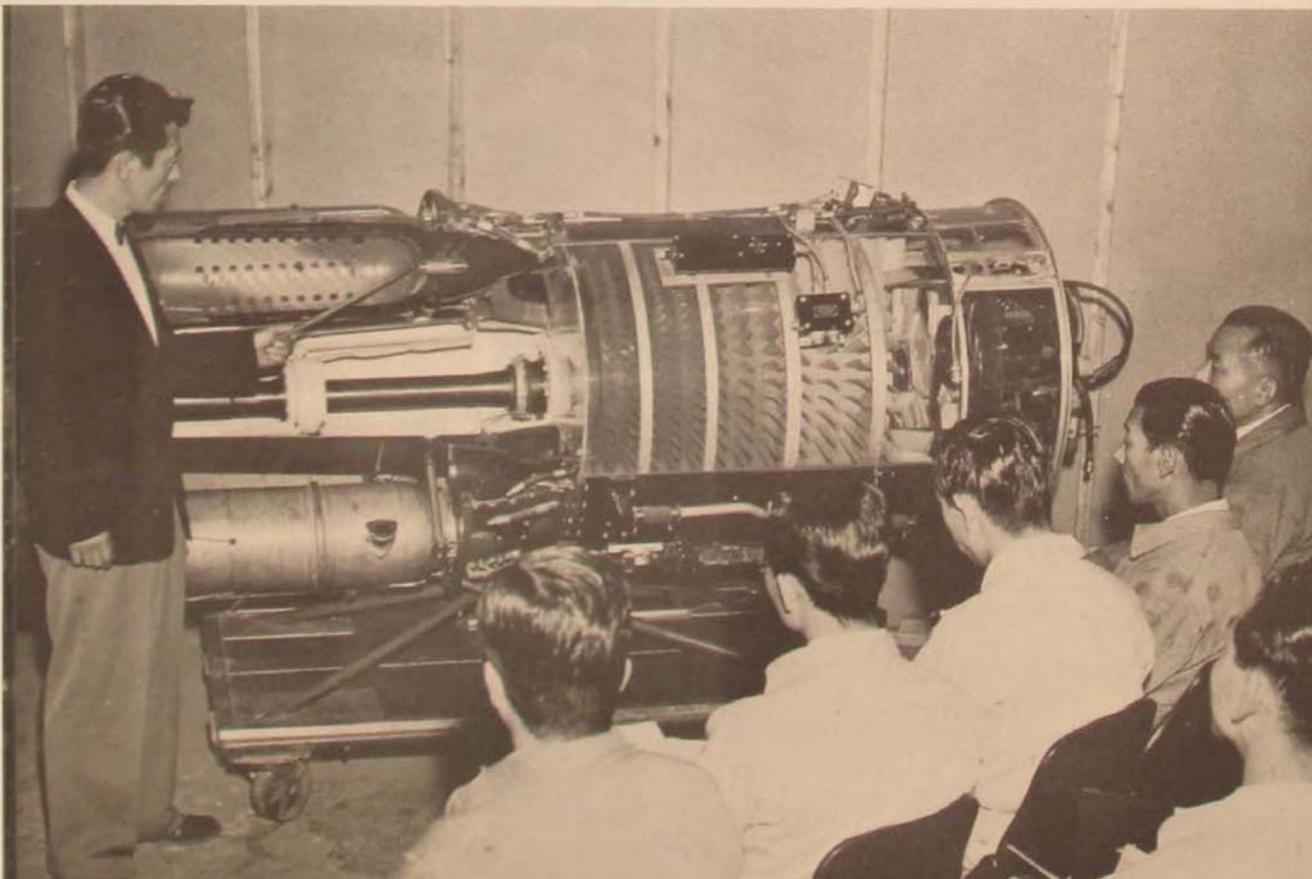
The reorganized Mitsubishi concern is in the best financial shape of any of the aviation firms with a capitalization of \$7,770,000. Their experience in engine production—44 per cent of Japan's aircraft engines in 1944—enabled them to enter into an agreement with America's Pratt and Whitney to manufacture and sell parts for several P&W engines used by commercial airlines in Japan. The company hopes to advance to the complete manufacture of the engine.

The Air Force detachment at the Mitsubishi plant is similar to that at any American aviation plant. A contracting officer, a depot representative, and enlisted specialists are available to provide technical assistance and contract supervision.

Early in 1954 negotiations were completed between Mitsubishi and the Far East Air Logistic Force for the overhaul of 21 F-86's during the year. In anticipation of this contract 14 Mitsubishi employees had received F-86 training from the Air Logistic Force in December 1953. To fulfill this new



A B-26 gets final touches and preflight inspection at the doors of Mitsubishi's new plant near Nagoya, Japan. The plane is one of 18 B-26's overhauled in the first six months of a contract with the USAF. Below, Mitsubishi employees are instructed on the functioning of the J-47E engine, power plant of the F-86. The Japanese instructor, an Air Force employee, holds an aeronautical engineering degree.



Shin Meiwa Industry Company

THE firm that emerged from the war and its subsequent reorganizational period as the Shin Meiwa Industry Co., Ltd. formerly was the Kawanishi Company that produced giant four-motor flying boats for the Japanese Imperial Navy. Its monthly production during 1944 and 1945 reached 130 fighter planes, 20 four-engine flying boats, 50 two-engine medium bombers, 150 cannon turrets, accessories for 1900 planes, and machine parts totaling 250 tons.

These gigantic facilities, employing 77,400 people, operating 9060 machines and occupying 120 acres of floor space, were converted to peacetime production in 1945. Three-wheeled trucks, motorcycles, motor bikes, kerosene and diesel engines, and agricultural implements formed their production until 1950. Then they began to make napalm and jettisonable wing tanks for the Air Force Off-Shore Procurement Program. Off-shore procurement accounted for \$7,000,000 worth of orders which greatly aided in the rehabilitation of plant facilities. Also the firm gained valuable experience with USAF standards for materials, production, and inspection and testing methods. Indirectly the program also encouraged Japanese manufacturers engaged in supporting activities to produce raw materials conforming to rigid specifications.

The huge Konan plant of Shin Meiwa, 600-by-660 feet and previously used for the construction of giant flying boats, was repaired and set up to produce 4000 wing tanks monthly. The Air Force lowered production to 1000 monthly in 1953 after the cessation of hostilities in Korea.

In March 1954, after two years of planning, work was started on an aircraft overhaul plant adjacent to the American Security Force's Itami Air Base near Osaka, Japan. The Itami plant is designed to handle 24 T-6's, 18 F-7's, or 10 T-33's per month. Plans call for staffing the plant with 250 aviation specialists, ten per cent of whom have received overhaul and maintenance training from the Far East Air Logistic Force.

In March Shin Meiwa's Narou plant, near Nagoya, Japan, began overhaul work on British DeHavilland engines for the Japan Air Lines and other commercial lines operating through Japan. The plant was laid out with advice from DeHavilland technicians and equipped with British testing equipment. The Narou plant is capable of overhauling 50 engines and 75 propellers per month, with room for further expansion. Since the volume of DeHavilland engine repair is limited to a few engines each month, the company is anxious to secure Air Force contracts in order to keep the plant operating at capacity.

Showa Aircraft Company

JAPAN's wartime manufacturer of DC-3 cargo planes, the Showa Aircraft Company, Ltd., was founded in 1937. Their facility, with a land area of 18,000,000 square feet, was taken over during the occupation by the Air Force. The facility is located a few miles from Headquarters Far East Air Logistic Force on the outskirts of Tokyo. Presently leased by the Air Force, the plant is operated by the Showa Company under contract to provide manpower to overhaul vehicles and aircraft.

Vehicle overhaul and maintenance for the Air Force was begun here in

These aircraft engines have been overhauled by the Showa Aircraft Company and are now ready for delivery. An Air Force inspector and a Japanese plant official make a final check before motors are shipped out. Repair contracts with Japanese firms have not only provided economical and eminently satisfactory maintenance support for FEAF but have given the Japanese aircraft industry the necessary volume of business to buy new equipment and rebuild their plants and their labor forces.



1947. In 1953 other contracts were signed for the overhaul of Army liaison aircraft and Air Force C-45's. Through December 1953 the plant had overhauled a total of 218 aircraft and 472 aircraft engines. Work began on repairing Air Force H-19 helicopters that December. The company currently employs almost 2500 people. More than a thousand of these employees have previous aircraft-building experience. Nearly 2000 pieces of machinery and equipment are owned and operated by the company.

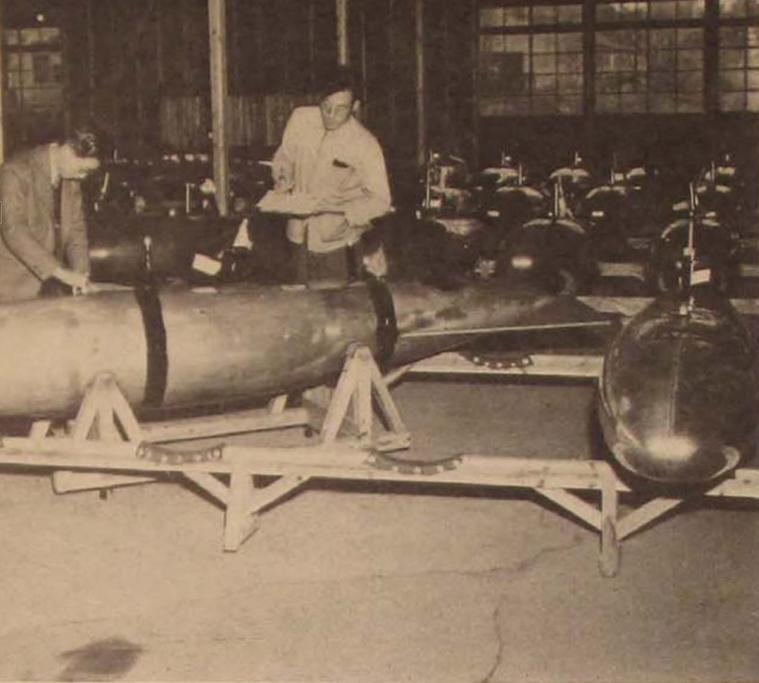
The Showa Company hopes to secure additional aircraft work from the Air Force. It estimates it can handle 25 small planes, 15 aircraft of the B-26 or C-47 class, and five special craft, such as helicopters, each month. In addition the plant is capable of processing 50 small engines and 45 medium plane engines per month. The firm could achieve this maximum production within three months. The "mobilization" plans call for an increase of 190 pieces of machinery and equipment, construction of an engine test building, and hiring an additional 1468 workers. A further increase in the number of workers is dependent upon the schedule when and if a contract is made.

Long-range plans call for utmost utilization of all facilities and property in storage when the Air Force completely releases its tenancy of the plant and grounds. This maximum utilization will take the form of stepped-up overhaul work, plus the monthly manufacture of 16 aircraft. The 16 planes would be 10 DC-3's or B-26's, 3 single-engine planes, and 3 helicopters.

Nakajima Aircraft Company

STILL another former big name in Japanese aviation, Nakajima Aircraft Company, is making a bid for return to the aviation business. The parent Nakajima Company was split into 12 separate companies at the end of the war. Organizationally weak, the separate companies turned from aircraft to scooters and engines, auto parts, bus bodies, auto engines, sound projectors, and sewing machines.

In 1952 Fuji Heavy Industry, Ltd. was reorganized from the former Nakajima holdings. The company is anxious to return to the aviation field but



Rows of brand new wing tanks get their final check by Fuji Heavy Industry plant manager and USAF inspector before they are crated and delivered to the Far East Air Logistic Force. Local procurement of items such as wing tanks has saved American taxpayers millions of dollars, has eliminated the pipeline delay in acquiring these items from the U.S., and has reduced pressure on essential shipping space.

cannot do so until the U.S. Security Forces can release several large buildings housing American hospital supplies.

Fuji Heavy Industry has been producing napalm and wing tanks for the Far East Air Logistic Force.

In November 1953 the firm concluded a licensing agreement with the Beech Aircraft Corporation to manufacture the Beechcraft T-34 "Mentor." The "Mentor" is a military training plane. Company officials plan to produce 60 of the aircraft this year.

The Japanese Government and Aviation

THE Japanese government is doing everything in its power to foster the rebirth of the aviation industry. The Ministry of International Trade and Industry acts as a clearing house for all Japanese aviation plans. The government plans to purchase a number of American type aircraft in 1954, ranging from jet trainers to cargo and liaison planes. Some of the funds for these planes are expected to come from the Mutual Security Assistance (MSA) agreement.

A long-range estimate of the commercial aviation field in Japan predicts a market for only 100 cargo planes in the next five years. Future production will concentrate on trainers, fighters, and liaison planes. The government, in cooperation with the private aviation firms, has scheduled the types of aircraft to be produced by each plant as the arrangements are completed for licenses from American manufacturers and the necessary funds are appropriated. For the most part the plants currently engaged in the Air Force overhaul program are scheduled to manufacture the same type of plane or accessory with which they have gained maintenance experience. The expensive licensing is to be borne by the firms in an initial lump, and later is to be charged off to the government as it orders the aircraft.

In cooperation with the government, four Japanese aircraft firms have each put up \$55,556* to form the Nihon Jet Company. The company was

*[Odd dollars result from conversion from yen.—Ed.]

established to conduct jet engine experiments. The government has invested \$111,111 and expects to put an additional \$277,778 into the company. Bailment of a J-33 engine to this group of Japanese manufacturers for research and development purposes was made by the Air Force. This bailment contract has included disassembly and assembly of the engine, as well as instruction on its testing.

JAPANESE AVIATION'S FUTURE

THE Japanese aviation industry is confronted with many financial, technical, and political problems. The industry is beginning to return to its prime interest, military aviation production. It has a large expansion potential in physical facilities which can be readily repaired from their war-damaged state. That the Japanese have the manpower capable of mass production is shown by their wartime records.

On the whole the firms are staffed by able executives, many of whom hold degrees from such universities as Michigan, Harvard, UCLA, and Massachusetts Institute of Technology. Furthermore they have the skilled engineering and aviation personnel. Most firms were able to save these skills during the bleak postwar years by diverting them to such activities as truck, scooter, sewing machine, and refrigerator production. Thousands of pieces of heavy equipment are held in dead storage throughout Japanese industry, ready to be put to use again.

Aside from the obvious benefits to the Air Force in savings of time and tax dollars, the IRAN (Inspect, Repair as Necessary) Program is re-educating Japanese aviation personnel from the workers to the executives. It is teaching them the modern up-to-date production methods and standards which the Japanese have missed out on in the last eight years. From ground safety to time-and-motion studies, from quality control, to mass-production techniques, Japanese industry is learning first-hand under the broad supervision of Air Force specialists.

The Japanese Ministry of International Trade and Industry estimates that it will cost \$5,555,556 to conduct the research and studies necessary to bring Japan up to American aviation standards, with another \$83,333,333 to modernize their production lines. The big question: "Where will the money come from?" As yet the question has not been answered. But Japanese determination, backed by American technical assistance, seems certain to find a way. The Japanese aircraft industry is getting to its feet.

Headquarters, Far East Air Logistics Force

Books and Ideas . . .

The Air Force Doctrinal Manuals

COLONEL ROYAL H. ROUSSEL

A SERIES of interrelated doctrinal manuals which the Air Force is publishing now reflects the greatly refined results of more than thirty years of research, study, analysis, and codification of experience bearing on the conduct of air operations in support of the nation's objectives.

The first books of their kind to be written from the air point of view and to be designed primarily for the use of Air Force personnel, they replace manuals containing air operations doctrine that were prepared under U.S. Army direction prior to unification of the Armed Forces and before the development of jet-atomic capabilities.

The first of these air doctrinal manuals, published in March 1953, bears the significant title of *United States Air Force Basic Doctrine* and the designation of AFM 1-2.¹ This manual is deceptively small. It is only 4¼ by 6¾ inches in size and contains only seventeen pages. But it is the keystone of the whole series of manuals, the master guide for the employment of air forces in operations of all types. In clear, concise style it sets out the fundamental pattern for the command and employment of air forces in peace and war. It is therefore an essential reference for those who are to understand and comprehend fully the capabilities and limitations of air power as an instrument of national policy.

Air Force Manual 1-2 presents the basic doctrine of the Air Force in five sections:

- Section I: Military force as an instrument of national policy
- Section II: The relationship of military forces
- Section III: Air forces and the principles of war
- Section IV: Employment of air forces
- Section V: Air power and national security

From these considerations AFM 1-2 arrives at the conclusion that air forces are most likely to be the dominant forces in war. In this capability for achieving decision in war, air forces find their unparalleled strength and capacity for operations for the maintenance of world peace.

With AFM 1-2 as a guide other manuals have been written to extend its basic truths in application to the specific types of operation which the Air Force performs. Thus the type of information to be provided in the completed series of manuals will encompass the whole pattern for the planning and employment of Air Force units in operations which will make the most of their inherent capabilities in peace, cold war without armed hostilities, limited war, or general war.

¹AFM 1-1 is the Air Force's designation for Joint Action Armed Forces.

The Chief of Staff, USAF, in a foreword prepared for the manuals project, emphasized that in the operations of military forces unity and consistency of purpose are derived from a common understanding of the principles involved. He added:

These principles, together with policies and established beliefs which have been developed by experience or by theory are known as doctrine. One of the purposes of military doctrine is to provide a basis for mutual understanding within a military force, or among military forces, which generates mutual confidence between commanders and between commanders and their subordinates. Military air doctrine which is announced and understood thus provides a basis for taking positive action in situations when for whatever reason precise instructions have not been issued. It indicates and guides but does not limit action during application.

In addition to the basic manual, AFM 1-2, USAF has published six of the more specialized books. These are: *Theater Air Operations* (AFM 1-3); *Air Defense Operations* (AFM 1-4); *Air Operations in Conjunction With Amphibious Operations* (AFM 1-5); *Employment of Atomic Weapons in Theater Air Operations* (AFM 1-6); *Theater Air Forces in Counter Air, Interdiction and Close Air Support Operations* (AFM 1-7); and *Strategic Air Operations* (AFM 1-8).

At Headquarters USAF, for final coordination, are three other manuals in draft form. These are: *Air Transport Operations*; *Theater Air Reconnaissance Operations*; and *Theater Airlift Operations*.

In addition, two manuals are currently in preparation. These are: *Evasion and Escape Operations* and *Air Psychological Warfare Operations*.

As of this date the publication of other manuals is not foreseen in the immediate future. It is expected, however, that there will be a considerable amount of revision in those which have been published. These revisions will not alter the basic doctrine involved but will serve principally to clarify the place of air forces as an instrument of national policy. AFM 1-2 (Basic Doctrine) already is under active revision for this purpose.

Air Force Regulation 5-54, dated 17 May 1954, specifies that major commands will ensure that a copy of each unclassified Air Force Manual on air doctrine is issued to assigned commissioned officers.

The regulation stipulates that the commands also will ensure that all commissioned officers are "thoroughly familiar with the contents of these manuals." It states further: "To provide Air Force personnel with a unified basis for promoting the effective employment of air forces, the policy of the Air Force is that all commissioned officers understand and utilize established air doctrine. To facilitate fulfillment of this policy, each commissioned officer will be provided with his own copy of each unclassified Air Force Manual on Air Doctrine."

Foundation of the Manuals

THE work upon which the writing of the manuals is based stretches back in a continuous line of activity for more than thirty years. It began in the period immediately after World War I, when it was becoming increasingly evident that air power was radically altering the dimensions of war. War was destined to become total, its impact more sudden, and its destruction exceedingly more devastating. Air forces could be foreseen which would be able to deliver crippling attacks not only on the battlefield but also upon a great variety of targets well within the homeland of an enemy power. That

capability could erase the necessity of defeating the opposing armed forces as a prerequisite to the destruction of the sustaining elements of a nation's strength. This being so, it would become necessary to evaluate military forces constantly in terms of national survival and ultimate success in war. Air Force doctrine as expressed today in AFM 1-2 takes full cognizance of the changes that have occurred.

In 1922 there was set up at Langley Field, Virginia, the first of four agencies whose work has supplied an important background of information, principles, and concepts for the preparation of the doctrinal manuals that the Air Force now is publishing. This was the Air Service Board. Its members were directed to study and analyze air warfare and to submit recommendations for the improvement of the Air Service.

This group, later known as the Air Corps Board, was succeeded in 1926 by the Air Corps Tactical Board. In 1933 the Air Corps Tactical Board was relocated at Maxwell Air Force Base with the Air Corps Tactical School, and in 1942 it was superseded by the Army Air Forces Board, which worked at Orlando, Florida. In the summer of 1946, with the nearing establishment of a co-equal Air Force, the Army Air Forces Board was dissolved, and the responsibility for continuing the work that had been begun in 1922 was passed to Air University.

In 1947 the National Security Act was adopted. The Army Air Forces were constituted as the United States Air Force. Certain responsibilities for the security of the nation were assigned to the USAF, and there developed the immediate need for manuals which would set out the fundamental truths for the conduct of air warfare and the command and employment of air forces. The constantly increasing significance of air forces as an instrument of national policy in the conduct of cold war operations gave added emphasis to the need for this kind of guidance.

Within Air University the manuals project was assigned to Air War College, and thence to the Evaluation Staff.

Preparation of the Manuals

In the foreword of AFM 1-2, the first manual, it is noted that "basic air doctrine evolves from experience gained in war and from analysis of the continuing impact of new weapons systems on warfare." And the pattern for the work on the manuals may be discerned in this brief statement. Full use is made of the knowledge of air warfare that has been accumulated in the research and studies that have gone on continuously for the last thirty-odd years and the experience available from individuals and organizations elsewhere in the Air Force.

Although the Evaluation Staff is the project agency for the preparation of the manuals, the completed manuals actually are products of the entire Air Force. This is so because project officers never undertake to write manuals in isolation, or in a so-called ivory tower atmosphere. For them it is a practical, realistic job from the outset. They work in close collaboration with representatives of the Air Staff and of the major commands, and this kind of collaboration prevails from the time a manual project is begun until the manual is approved for publication.

In one of the conferences on theater air forces, held at Headquarters

USAF in September 1953, there were represented, in addition to the project officers, the Tactical Air Command, the Far East Air Forces, United States Air Forces in Europe, and, from the Air Staff, the Directorate of Operations and the Directorate of Intelligence.

At another time, when the first draft of the theater air reconnaissance manual was discussed at Air University in November 1953 there were present, in addition to the project officers, representatives from Headquarters USAF, the Strategic Air Command, and the Tactical Air Command.

This kind of representation is typical in all of the manuals projects.

Project officers who work on the manuals also work on a variety of specific studies and special assignments, most of which originate as requirements in Headquarters USAF. Much of the research and field work done for these assignments is of a type which, in addition to its application to the specific problem of the study in question, has an important additional value in that the effort often contributes directly to the currency and completeness of information considered in the preparation of manuals.

Typical of the studies of this scope is one concerning the impact of new weapons on the traditional concepts of warfare. Others have concerned the potentials of high-yield weapons against troop concentrations and the delivery of atomic weapons by fighter aircraft in strategic air operations.

The project officers invariably go to the sources of information if they can get better results by such effort. It was not singular that one of the project officers was flying resupply missions in Korea when the armistice came or that on an earlier occasion another project officer, equally intent on obtaining current information for an air defense problem, made a fast trip to London for a large-scale air defense test so that his project could have the benefit of study of the latest British techniques. Project officers on the doctrinal manuals also are observers at most large-scale maneuvers, tests, and exercises of the armed forces. At Air University they have access, in the course of their research, to extensive archives and libraries which contain the thoughts, lectures, comments, and writings of the world's finest authorities on military air power as an instrument of national policy and on aircraft, weapons systems, the conduct of air warfare, and associated subjects.

It is against this comprehensive background that the doctrinal manuals are prepared.

What the Manuals Offer

THE manuals that are written at Air University are concerned primarily with basic doctrine. They are written with the conviction that the application of this doctrine to the roles and missions of the United States Air Force will promote an effective employment of air power in military operations. They provide foundation material and are directed to commanders and their staffs. Beyond these basic manuals others are needed to deal with the implementation of basic doctrine. These manuals will provide operational doctrine and be the vehicles through which the basic doctrine is applied.

Air University recognizes a practical distinction between basic doctrine and operational doctrine. It believes that it is the logical agency for the preparation of the basic type doctrine, but it does not believe that it should extend its work into the operational tactics and techniques that are the responsi-

bilities of the other commands concerned. The difference between the two types of manuals is that it is possible to express the basic doctrine in broad terms dealing essentially with *what* is to be done. Thus it was possible to write AFM 1-2 in seventeen pages. The operational type doctrine—being concerned primarily with *how* things are to be done—is necessarily more detailed.

Occasionally a reader who is not fully aware of the cut-off point between the two types of doctrine may feel that the basic manuals are too generalized. But for their purpose they are complete. When all manuals contemplated in the program have been published, they will extend across the board of Air Force operations.

The nature of AFM 1-2 has been summarized. Brief descriptions of the other manuals follow:

AFM 1-3, *Theater Air Operations*. Principles for the conduct of air warfare in a theater of operations and for the command and control of air forces. Written from the perspective of the entire theater, this manual is a basic guide for correlating and coordinating the operations of Air Force forces with other forces in the theater.

AFM 1-4, *Air Defense Operations*. A broad discussion of the operations through which the Air Force discharges its responsibility for the air defense of the United States. This manual discusses the static air defense system and the interdependence of offensive and defensive forces in security measures for the United States. It defines the authority of air commanders.

AFM 1-5, *Air Operations in Conjunction With Amphibious Operations*. Sets out the responsibilities, functions, tasks, organization, command and control arrangements, and employment of Air Force forces in amphibious operations. This manual provides guidance for Air Force commanders and staff officers who are responsible for air planning and for the execution of air operations associated with amphibious operations, clarifies questions relating to operations under unified command.

AFM 1-7, *Theater Air Forces in Counter Air, Interdiction, and Close Air Support Operations*. A discussion of the circumstances involved in the conduct of operations of these types. The manual stresses the essentialness of control of the air and of the centralized control of the air forces involved. It supplements AFM 1-3, *Theater Air Operations*, provides guidance for air commanders in operations in collaboration with forces of other services.

AFM 1-8, *Strategic Air Operations*. Written to relate the unity and decisive nature of air warfare (as expressed in AFM 1-2) to air operations against the sustaining elements of a nation's strength. This manual discusses global strategy, relating strategic air operations to other military actions. It does not contain operations details concerning techniques or procedures of the Strategic Air Command.

Air Transport Operations (draft). Prepared to provide the information for a broad understanding of the principles governing the operation of a global transportation system. This manual is intended to be a guide toward an understanding of the essential considerations in the operation of a worldwide system of airborne logistics.

Theater Air Reconnaissance Operations (draft). Discusses the responsibilities of the Air Force for reconnaissance in theater operations in their application to other air forces and to military forces of other types. This

manual is intended as a guide upon which air commanders can base the formulation of operational procedures.

Theater Airlift Operations (draft). A manual planned for the guidance for Air Force commanders and staffs in planning and conducting airlift operations in a theater. It also contains essential information for non-Air Force personnel concerned with the support or utilization of theater airlift.

Evaluation Staff, Air War College

The Quarterly Review Contributors

GENERAL THOMAS D. WHITE (U.S.M.A.) is the Vice Chief of Staff, USAF. Prior to his present assignment, General White was Deputy Chief of Staff for Operations. He was appointed the Air Force member of the Joint Strategic Survey Committee in the Office of the Joint Chiefs of Staff in May 1950. He also served as Director of Legislation and Liaison in the Office of the Secretary of the Air Force. In 1948 he went to the Far East as Commanding General of the Fifth Air Force. During World War II, General White was Commanding General of the Seventh Air Force from 1945 to 1946. In September of 1944, he became Deputy Commander of the Thirteenth Air Force. In this capacity he served in the New Guinea and Southern Philippines campaigns, and participated in the assaults in Palawan, Zamboanga, in the Philippines and Tarakan in Borneo. Prior to this time, he was Assistant Chief of the Air Staff for Intelligence at AAF Headquarters in Washington. General White entered the Army as a 2nd Lieutenant on 2 July 1920. Soon thereafter he was promoted to 1st Lieutenant and entered the Infantry School at Fort Benning, Georgia. In September 1924 he entered the Air Service Primary Flying School at Brooks Field, Texas. Upon completion of the course he transferred to the Air Service Advanced Flying School at Kelly Field, Texas, from which he was graduated in September 1925. In March 1927 he transferred from the Infantry to the Air Corps. In later years General White served as assistant military attache at Moscow, Russia, and in Italy and Greece. In April 1940 he became military attache to Rio de Janeiro, Brazil, and the following August was named Chief of the U.S. Military Air Mission to Brazil. He is a graduate of the Air Corps Tactical School and the Command and General Staff School.

DR. ROBERT STRAUSS-HUPÉ (M.A. and Ph.D., University of Pennsylvania) is a professor of Political Science, Wharton School of Finance and Commerce, at the University of Pennsylvania. Since 1952 he has been Chairman of

the International Relations Group at the University of Pennsylvania. At the present time he is lecturer to the Air War College, Maxwell Air Force Base, Alabama. In 1951 he lectured at the College of Europe, Bruges, Belgium. He is a lieutenant colonel in the United States Army Reserve and has served as consultant to various governmental agencies, one of which is the United States Air Force Academy Planning Group. He is the author of several books including *The Russian-German Riddle*, 1940; *The Balance of Tomorrow*, 1945; *International Relations*, 1950; and *The Zone of Indifference*, 1952.

COLONEL EDWARD H. NIGRO is now an instructor at the Armed Forces Staff College in Norfolk, Virginia. Prior to his instructing duties, he was a student at this college. From June 1950 to November 1952 he was assigned to Hq FEAFF as Assistant Chief of Combat Operations, commander of C-46, C-54, and C-124 groups, and Deputy Wing Commander of 374th TC Wing. In the Korean Campaign, he received the Legion of Merit, Distinguished Flying Cross, Air Medal (2 clusters), Bronze Star, and four campaign stars.

COLONEL GALE E. SNELL (M.S., Purdue University), is now Deputy for Procurement and Industrial Planning, Hq Far East Air Logistic Force. During the war, he was assigned to the office of Director of Maintenance, Fifteenth Air Force Service Command, and he subsequently served as maintenance officer of the 6400th Air Depot Wing which operates the Air Force Depot in Japan.

BRIG. GEN. ALFRED R. MAXWELL (U.S.M.A., Massachusetts Institute of Technology) is presently Senior Air Force Staff Officer to the Assistant Secretary of Defense, Research and Development (formerly Research and Development Board). When World War II started he was transferred from his post as Assistant Commandant of the Air Corps Engineering School to Washington, where he rose to Chief, Bombardment Requirements Branch, Headquarters Army Air Forces. In 1944 General

Maxwell became Director of Operations, U.S. Strategic Air Forces in Europe. Since World War II, he has held several assignments related to technology and strategy including the assignment as Deputy Commander, Air Research and Development Command.

FRANK W. ANDERSON JR. (M.A., Ph.D., University of North Carolina), is the Managing Editor of the *Air University Quarterly Review*. He is a First Lieutenant in the USAF Reserve and spent two years in England during World War II as a photo interpreter in the Allied Central Intelligence Unit.

MAJOR ANDREW T. SOLTYS, U.S. Army, is Anti-aircraft Intelligence Officer, Deputy for Intelligence, Headquarters, FEAFF.

COLONEL RICHARD C. WELLER (B.S., Fordham) is Director of the Extension Course Division, Air War College, Maxwell AFB, Alabama. He commanded Losey Field, Puerto Rico, and

served as Air Officer, Caribbean Defense Command, and Chief of Staff of the Sixth Air Force during World War II. Later as air member of Bilateral Staff Conversations with Chile, he aided in establishing Air Force requirements of that nation in the Hemispheric Defense Pact. He is a graduate of the Armed Forces Industrial College.

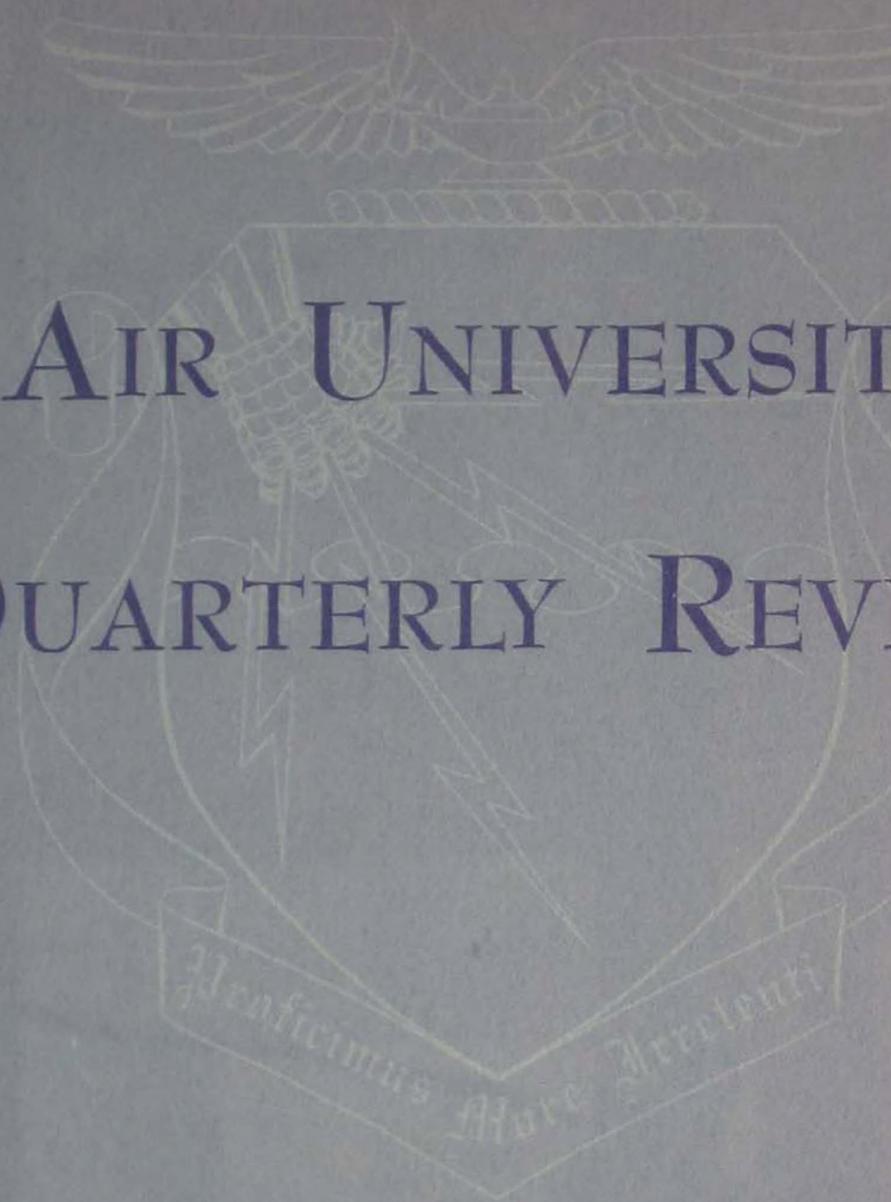
COLONEL ROYAL H. ROUSSEL has been a member of the Evaluation Staff of the Air War College since July 1952. Previously he was Deputy Executive Assistant for the Secretary of the Air Force and prior to that assignment was in the War Plans Division, Hq USAF. During World War II he served as A-2 of the 9th Bombardment Division, ETO. Commissioned in the Civilian Procurement Program, he was formerly Associate Editor of *The Houston Press*. His first military service was with the Air Service in 1918.

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